Final Third Quarter 2014 - Quarterly Groundwater Monitoring Report Inside Tunnel Wells

Red Hill Bulk Fuel Storage Facility
Joint Base Pearl Harbor-Hickam, Oahu, Hawaii

DOH Facility ID: 9-102271

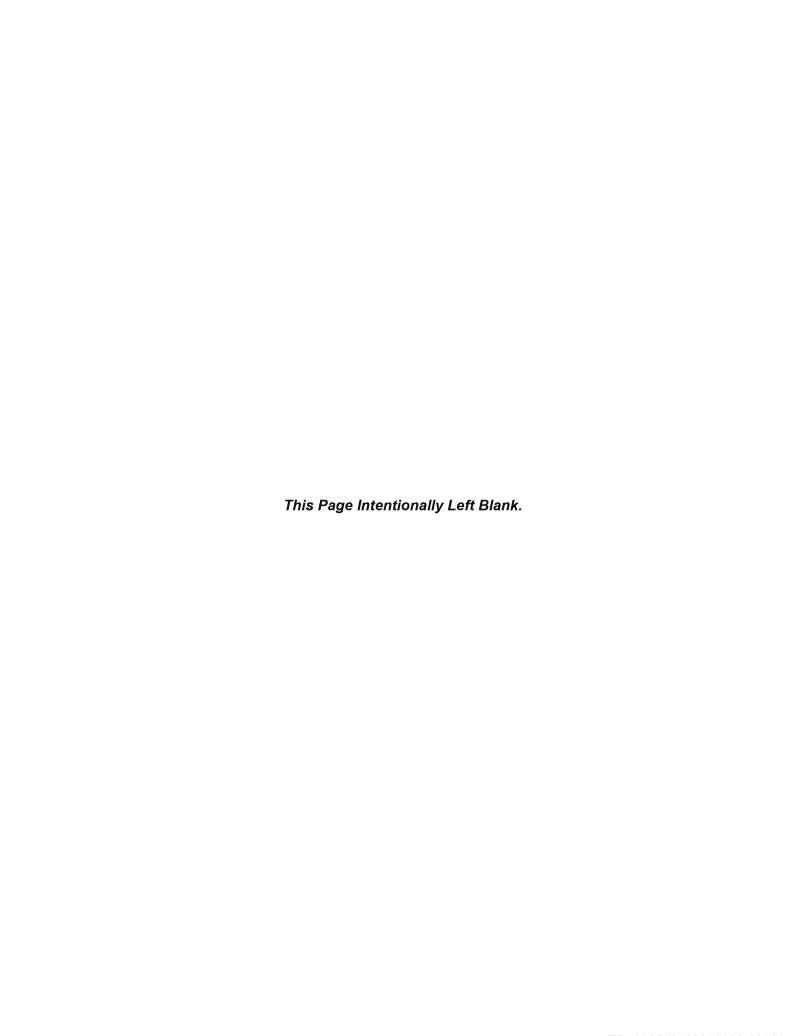
DOH Release ID: 990051, 010011, 020028, and 140010

September 2014

Department of the Navy Naval Facilities Engineering Command, Hawaii 400 Marshall Road JBPHH HI 96860-3139



Contract Number N62742-12-D-1853, CTO 0002



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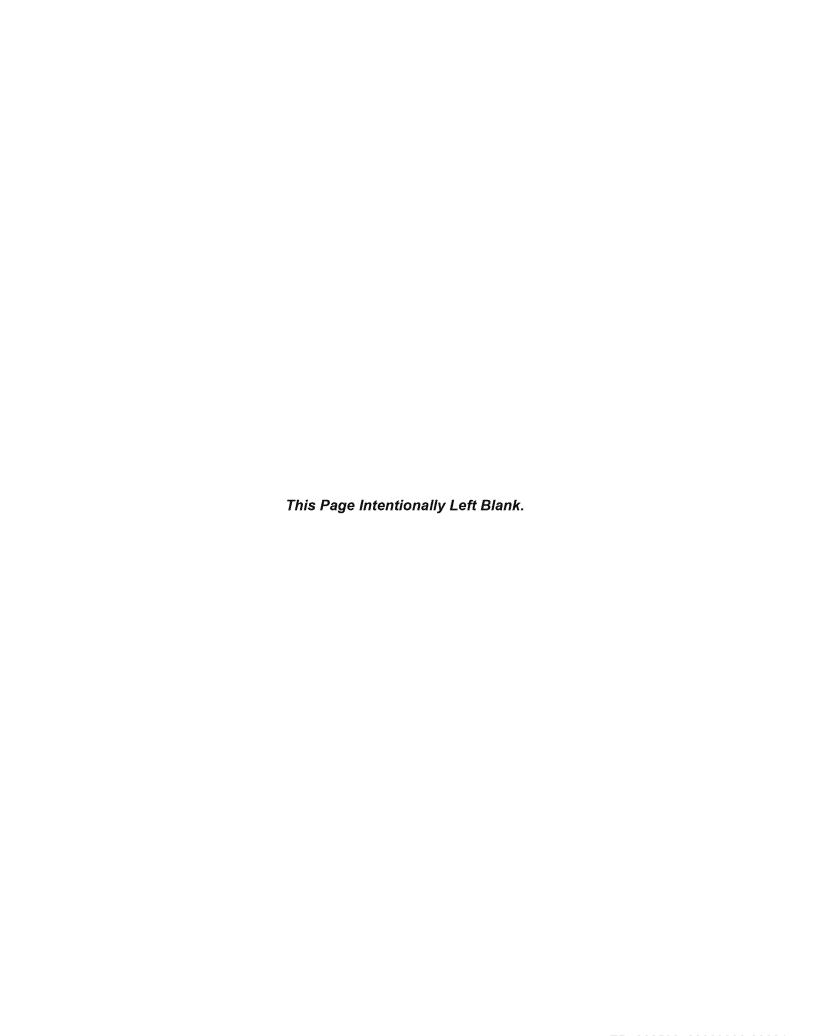
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Prepared under:

Contract Number N62742-12-D-1853, CTO 0002



FINAL THIRD QUARTER 2014 - QUARTERLY GROUNDWATER MONITORING REPORT INSIDE TUNNEL WELLS RED HILL BULK FUEL STORAGE FACILITY

Long-Term Groundwater and Soil Vapor Monitoring Red Hill Bulk Fuel Storage Facility Joint-Base Pearl Harbor-Hickam, Oahu, Hawaii

Prepared for:

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Contract Task Order 0002

Contract No. N62742-12-D-1853

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ACRONYMS AND ABBREVIATIONS

ACRONYMS/

ABBREVIATIONS DEFINITION/MEANING

% percent

bgs below ground surface

COPC Contaminant of Potential Concern

DLNR State of Hawaii Department of Land and Natural Resources

DOH State of Hawaii Department of Health

DON Department of the Navy
EAL Environmental Action Level
EPA Environmental Protection Agency
ESI Environmental Science International

F-76 Marine Diesel Fuel ID Identification

JBPHH Joint Base Pearl Harbor-Hickam

JP-5 Jet Fuel Propellant-5
JP-8 Jet Fuel Propellant-8
LCS Laboratory Control Sample

LCSD Laboratory Control Sample Duplicate

LOD Limit of Detection
LOQ Limit of Quantitation

µg/L micrograms per liter

MS Matrix Spike

MSD Matrix Spike Duplicate

NAVFAC Naval Facilities Engineering Command

NAVSUP FLC Naval Supply Systems Command Fleet Logistics Center

PAH Polycyclic Aromatic Hydrocarbons

PARCCS Precision, Accuracy, Representativeness, Completeness, Comparability,

and Sensitivity

pH hydrogen activity

RHSF Red Hill Bulk Fuel Storage Facility
RPD Relative Percent Difference
SAP Sampling and Analysis Plan
SSRBL Site-Specific Risk-Based Level
TEC The Environmental Company, Inc.
TPH-d Total Petroleum Hydrocarbons as diesel
TPH-g Total Petroleum Hydrocarbons as gasoline

TPH-g Total Petroleum Hydrocarbo
U.S. United States of America
UST Underground Storage Tank

UST Underground Storage Tank
VOC Volatile Organic Compound

WP Work Plan

Contract	Task	Order	0002

Contract No. N62742-12-D-1853

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EXECUTIVE SUMMARY

This quarterly groundwater monitoring report presents the results of the third quarter 2014 groundwater sampling conducted on July 21 and 22, 2014, at the Red Hill Bulk Fuel Storage Facility [RHSF], Joint Base Pearl Harbor-Hickam [JBPHH], Hawaii. The RHSF is located in Halawa Heights on the Island of Oahu. There are 18 active and 2 inactive Underground Storage Tanks [USTs] located at the RHSF. The State of Hawaii Department of Health [DOH] Facility Identification [ID] number is 9-102271. The DOH Release ID numbers are 990051, 010011, 020028, and 140010.

The groundwater sampling was conducted as part of the long-term groundwater and soil vapor monitoring at the RHSF and concurrent with release response activities initiated at Tank 5 in January, under Naval Facilities Engineering Command [NAVFAC] Contract Number N62742-12-D-1853. The sampling was conducted in accordance with the approved 2012 Work Plan [WP]/Sampling and Analysis Plan [SAP] prepared by Environmental Science International, Inc. [ESI].

On July 21 and 22, 2014, ESI personnel collected groundwater samples from four monitoring wells at the RHSF (wells RHMW01, RHMW02, RHMW03, and RHMW05) and one sampling point at Red Hill Shaft (RHMW2254-01). A primary and duplicate sample were collected from well RHMW02. A summary of the analytical results is provided below.

- RHMW01 Total Petroleum Hydrocarbons as diesel fuel [TPH-d] (67 micrograms per liter [µg/L]) was the only analyte detected. The TPH-d concentration detected did not exceed the DOH Environmental Action Levels [EALs] or the site-specific risk-based level [SSRBL]. TPH-d concentrations in this well have shown an overall decreasing trend from a high of 1,500 µg/L in February 2005.
- RHMW02 TPH-d (1,200 and 1,300 μg/L), Total Petroleum Hydrocarbons as gasoline [TPH-g] (48 and 49 μg/L), xylenes (0.36 and 0.33 μg/L), acenaphthene (0.52 and 0.50 μg/L), fluorene (0.24 and 0.23 μg/L), 1-methylnaphthalene (25 and 26 μg/L), 2-methylnaphthalene (20 and 22 μg/L), and naphthalene (71 and 76 μg/L) were detected. TPH-d was detected at concentrations above the DOH EALs for both drinking water toxicity and gross contamination, but below half the SSRBL. The polycyclic aromatic hydrocarbons [PAHs] 1-methylnaphthalene and naphthalene were detected at concentrations above the DOH EALs for both drinking water toxicity and gross contamination. 2-Methylnaphthalene was detected at concentrations above the DOH EAL for gross contamination. TPH-d concentrations have generally been decreasing in this well since January 15, 2014; however, the concentrations of 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene increased to their highest levels since January 2013.
- RHMW03 TPH-d (37 μg/L) was the only analyte detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.

- RHMW05 None of the chemical constituents analyzed for were detected.
- RHMW2254-01 None of the chemical constituents analyzed for were detected.

Between January and July 2014, the sampling frequency of the wells and monitoring point inside Red Hill increased, due to response activities related to a reported release at Tank 5. Since the previous quarterly sampling event in April 2014, three wells (RHMW01, RHMW02, and RHMW05) and one sampling point (RHMW2254-01) have each been sampled three times, including this quarterly event. During this period only TPH-d in RHMW01 and TPH-d, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene in RHMW02 were detected at concentrations exceeding the DOH EALs. However, the TPH-d concentration detected in RHMW01 only exceeded the DOH EAL during the April 7, 2014 release response groundwater monitoring event. TPH-d concentrations were less than half the SSRBL. Groundwater contaminant concentrations for this period in the other three wells (RHMW03, RHMW05, and RHMW2254-01) remained at low concentrations and did not change significantly, or were not detected.

Concentrations of 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene in RHMW02 show an increasing trend since March 5, 2014, but remain below the historic maximums detected in the well. All other analytical results were generally consistent with historical data.

Based on the groundwater monitoring results and the reported release at Tank 5 in January 2014, continued groundwater monitoring at the wells inside the RHSF tunnel is recommended. The next quarterly event is tentatively scheduled for October 2014.

SECTION 1 – INTRODUCTION

This quarterly groundwater monitoring report presents the results of the third quarter 2014 groundwater sampling conducted on July 21 and 22, 2014, at the RHSF, JBPHH. The RHSF is located in Halawa Heights on the Island of Oahu. The purpose of the sampling is to (1) assess the condition of groundwater beneath the RHSF with respect to chemical constituents associated with jet fuel propellant and marine diesel fuel, and (2) to ensure the Navy remains in compliance with DOH UST release response requirements as described in Hawaii Administrative Rules Chapter 11-281 Subchapter 7, *Release Response Action* (DOH, 2013). The DOH Facility ID number for the RHSF is 9-102271. The DOH Release ID numbers are 990051, 010011, 020028, and 140010.

The groundwater sampling was conducted as part of the long-term groundwater and soil vapor monitoring at the RHSF, under NAVFAC Contract Number N62742-12-D-1853. The sampling was conducted in accordance with the approved WP/SAP prepared by ESI (ESI, 2012).

1.1 SITE DESCRIPTION

The RHSF is located on federal government land (zoned F1- Military and Federal), located in Halawa Heights, approximately 2.5 miles northeast of Pearl Harbor (Figure 1). It is located on a low ridge on the western edge of the Koolau Mountain Range that divides Halawa Valley from Moanalua Valley. The RHSF is bordered on the north by Halawa Correctional Facility and private businesses, on the west by the United States of America [U.S.] Coast Guard reservation, on the south by residential neighborhoods, and on the east by Moanalua Valley. A quarry is located less than a quarter mile away to the northwest. The RHSF occupies 144 acres of land and the majority of the site is at an elevation of approximately 200 to 500 feet above mean sea level.

The RHSF contains 18 active and 2 inactive USTs that are operated by Naval Supply Systems Command Fleet Logistics Center [NAVSUP FLC] Pearl Harbor (formerly Fleet and Industrial Supply Center). Each UST has a capacity of approximately 12.5 million gallons. The RHSF is located approximately 100 feet above the basal aquifer. The USTs contain Jet Fuel Propellant-5 [JP-5], Jet Fuel Propellant-8 [JP-8], and Marine Diesel Fuel [F-76]. The current status of the USTs are summarized in Table 1.1.

Four groundwater monitoring wells (wells RHMW01, RHMW02, RHMW03, and RHMW05) and one sampling point at Red Hill Shaft (RHMW2254-01) are located within the RHSF lower access tunnel (Figure 2). Three groundwater monitoring wells (wells HDMW2253-03, OWDFMW01, and RHMW04) are located outside of the RHSF tunnel system. Monitoring data for the three wells located outside the tunnel are included in a separate report.

As noted, monitoring wells RHMW01, RHMW02, RHMW03, and RHMW05 are located inside the underground tunnels. Sampling point RHMW2254-01 is located inside the infiltration gallery of the Department of the Navy [DON] drinking water supply Well 2254-01. The DON Well

2254-01 is located approximately 2,400 feet downgradient of the USTs and provides potable water to the JBPHH Water System, which serves approximately 65,200 military customers. NAVFAC Public Works Department operates the infiltration gallery and DON Well 2254-01.

TABLE 1.1
Current Status of the USTs
Red Hill Bulk Fuel Storage Facility
July 2014 Quarterly Monitoring Report

	July 2017 Qualterly IV	ionitoring report	
Tank Identification	Fuel Type	Status	Capacity
F-1	None	Inactive	12.5 million gallons
F-2	JP-8	Active	12.5 million gallons
F-3	JP-8	Active	12.5 million gallons
F-4	JP-8	Active	12.5 million gallons
F-5	JP-8	Active	12.5 million gallons
F-6	JP-8	Active	12.5 million gallons
F-7	JP-5	Active	12.5 million gallons
F-8	JP-5	Active	12.5 million gallons
F-9	JP-5	Active	12.5 million gallons
F-10	JP-5	Active	12.5 million gallons
F-11	JP-5	Active	12.5 million gallons
F-12	JP-5	Active	12.5 million gallons
F-13	F-76	Active	12.5 million gallons
F-14	F-76	Active	12.5 million gallons
F-15	F-76	Active	12.5 million gallons
F-16	F-76	Active	12.5 million gallons
F-17	JP-5	Active	12.5 million gallons
F-18	JP-5	Active	12.5 million gallons
F-19	None	Inactive	12.5 million gallons
F-20	JP-5	Active	12.5 million gallons

F-76 Marine Diesel Fuel

1.2 PHYSICAL SETTING

Climatological conditions in the area of the RHSF consist of warm to moderate temperatures and low to moderate rainfall. The RHSF is leeward of the prevailing northeasterly trade winds. The average annual precipitation is approximately 40 inches, which occurs mainly between November and April (State of Hawaii Department of Land and Natural Resources [DLNR], 1986). Annual pan evaporation is approximately 75 inches (DLNR, 1985). Average temperatures range from the low 60's to high 80's (degrees Fahrenheit) (Atlas of Hawaii, 1983).

Oahu consists of the eroded remnants of two shield volcanoes, Waianae and Koolau. The RHSF is located on the southwest flank of the Koolau volcanic shield. Lavas erupted during the shield-building phase of the volcano belong to the *Koolau Volcanic Series* (Stearns and Vaksvik, 1935). Following formation of the Koolau shield, a long period of volcanic quiescence occurred, during which the shield was deeply eroded. Following this erosional period, eruptive activity resumed. Lavas and pyroclastic material erupted during this period belong to the *Honolulu Volcanic Series* (Stearns and Vaksvik, 1935).

JP-5 Jet Fuel Propellant-5

JP-8 Jet Fuel Propellant-8

In the immediate area of the RHSF, Koolau Volcanic Series lavas dominate, although there are consolidated and unconsolidated non-calcareous deposits in the vicinity that consist of alluvium generated during erosion of the Koolau volcanic shield. South-southwest of the RHSF, and in isolated exposures to the west, are pyroclastic deposits formed during eruptions from three Honolulu Volcanic Series vents, Salt Lake, Aliamanu, and Makalapa (Stearns and Vaksvik, 1935). Based on established geology and records of the drilled wells (Stearns and Vaksvik, 1938), the RHSF is underlain by Koolau Volcanic Series basalts. The area of the RHSF is classified as *Rock Land*, where 25-90% of the land surface is covered by exposed rock and there are only shallow soils (Foote, et al., 1972).

Groundwater in Hawaii exists in two principal types of aquifers. The first and most important type, in terms of drinking water resources, is the basal aquifer. The basal aquifer exists as a lens of fresh water floating on and displacing seawater within the pore spaces, fractures, and voids of the basalt that forms the underlying mass of each Hawaiian island. In parts of Oahu, groundwater in the basal aquifer is confined by the overlying caprock and is under pressure. Waters that flow freely to the surface from wells that tap the basal aquifer are referred to as artesian.

The second type of aquifer is the caprock aquifer, which consists of various kinds of unconfined and semi-confined groundwater. Commonly, the caprock consists of a thick sequence of nearly impermeable clays, coral, and basalt, which separates the caprock aquifer from the basal aquifer. The impermeable nature of these materials and the artesian nature of the basal aquifer severely restrict the downward migration of groundwater from the upper caprock aquifer. In the area of the RHSF, there is no discernible caprock.

Groundwater in the area of the RHSF is part of the *Waimalu Aquifer System* of the *Pearl Harbor Aquifer Sector*. The aquifer is classified as a basal, unconfined, flank-type; and is currently used as a drinking water source. The aquifer is considered fresh with less than 250 milligrams per liter of chloride and is considered an irreplaceable resource with a high vulnerability to contamination (Mink and Lau, 1990).

The nearest drinking water supply well is DON Well 2254-01, located in the infiltration gallery within the RHSF lower tunnel. The DON Well 2254-01 is located approximately 2,400 feet hydraulically and topographically downgradient of the USTs (Figure 2).

1.3 BACKGROUND

The RHSF was constructed by the U.S. Government in the early 1940s. Twenty USTs and a series of tunnels were constructed. The USTs were constructed of steel, and in the past have stored DON special fuel oil, DON distillate, aviation gasoline, and motor gasoline (Environet, 2010). The tanks currently contain JP-5, JP-8, and F-76. The fueling system is a self-contained underground unit that was installed into native rock comprised primarily of basalt with some interbedded tuffs and breccias (Environet, 2010). Each UST measures approximately 250 feet

in height and 100 feet in diameter. The upper domes of the tanks lie at a depth varying between 100 feet and 200 feet below ground surface [bgs].

In 1998, Earth Tech conducted a Phase II Remedial Investigation/Feasibility Study for the Oily Waste Disposal Facility located within the RHSF. The study included the installation of well OWDFMW01 (which was originally MW08) (Earth Tech, 1999).

In February 2001, the DON installed groundwater monitoring well RHMW01 to monitor for contamination in the basal aquifer beneath the RHSF. Well RHMW01 was installed approximately 100 feet below grade within the lower access tunnel. The depth to water was measured at 86 feet below the tunnel floor at the time of the well completion. In February 2001, a groundwater sample was collected from the well. Total Petroleum Hydrocarbons [TPH] and total lead were detected in the sample. Total lead was detected at a concentration above the DOH Tier 1 groundwater action level of 5.6 μ g/L (The Environmental Company, Inc. [TEC], 2009; DOH, 2000).

In 2005, the RHSF groundwater monitoring program was initiated. It involved routine groundwater sampling of well RHMW01 and sampling point RHMW2254-01. Samples were collected in February, June, September, and December of 2005. Lead was detected at concentrations above the DOH Tier 1 action level of 5.6 µg/L in samples collected in February and June. The samples collected in February and June were not filtered prior to analysis, whereas the samples collected in September and December were filtered prior to analysis. Since the samples collected in February and June were not filtered prior to analysis, the lead results were not considered appropriate for a risk assessment (TEC, 2008).

Between June and September 2005, TEC installed three additional groundwater monitoring wells (wells RHMW02, RHMW03, and RHMW04) (TEC, 2008). Well RHMW04 was installed hydraulically upgradient of the USTs to provide background geochemistry information for water moving through the basal aquifer beneath the RHSF. Wells RHMW02 and RHMW03 were installed approximately 125 feet below grade within the RHSF lower tunnel and well RHMW04 was installed to a depth of approximately 300 feet bgs outside of the RHSF tunnels. In September 2005, groundwater samples were collected from the three newly installed groundwater monitoring wells (wells RHMW02, RHMW03, and RHMW04) along with the existing well RHMW01 and sampling point RHMW2254-01. The contaminants of potential concern [COPCs] with concentrations exceeding current DOH EALs are summarized below.

- RHMW01 TPH-d was detected at concentrations above the DOH EAL.
- RHMW02 TPH-g, TPH-d, naphthalene, trichloroethylene, 1-methylnaphthalene, and
 2-methylnaphthalene were detected at concentrations above the DOH EALs.
- RHMW03 TPH-d was detected at concentrations above the DOH EAL.

In 2006, TEC installed dedicated sampling pumps in the four wells (wells RHWM01, RHWM02, RHMW03, and RHWM04) and one sampling point (RHMW2254-01). In July and December of

2006, groundwater samples were collected from the four wells and the sampling point. The COPCs with concentrations exceeding current DOH EALs are summarized below.

- RHMW01 TPH-d and naphthalene were detected at concentrations above the DOH EALs.
- RHMW02 TPH-g, TPH-d, and naphthalene were detected at concentrations above the DOH EALs.
- RHMW03 TPH-d was detected at concentrations above the DOH EAL.

IN 2007, SSRBLs were established for TPH (4,500 μ g/L) and benzene (750 μ g/L) (TEC, 2007). Groundwater samples were collected from wells RHWM01, RHWM02, and RHMW03, and sampling point RHMW2254-01. Samples were collected in March, June, and September of 2007. The COPCs with concentrations exceeding current DOH EALs are summarized below.

- RHMW01 TPH-d was detected at concentrations above the DOH EAL, but below the SSRBL.
- RHMW02 TPH-g, TPH-d, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were detected at concentrations above the DOH EALs. The TPH-d concentrations were below the SSRBL.
- RHMW03 TPH-d was detected at concentrations above the DOH EAL, but below the SSRBL.

In 2008, groundwater samples were collected from wells RHWM01, RHWM02, and RHMW03, and sampling point RHMW2254-01. Samples were collected in January, April, July, and October of 2008. The COPCs with concentrations exceeding current DOH EALs are summarized below. In addition, a groundwater protection plan (TEC, 2008) was prepared.

- RHMW01 TPH-d was detected at concentrations above the DOH EAL, but below the SSRBL.
- RHMW02 TPH-d, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were
 detected at concentrations above the DOH EALs. The TPH-d concentrations detected in
 October 2008 were also above the SSRBL.
- RHMW03 TPH-d was detected at concentrations above the DOH EAL, but below the SSRBL.

In April 2009, groundwater monitoring well RHMW05 was installed downgradient of the USTs, within the lower access tunnel between RHMW01 and RHMW2254-01. It was installed to identify the extent of contamination hydraulically downgradient of the USTs. Well RHMW05 was added to the quarterly groundwater sampling program. In 2009, quarterly groundwater samples were collect from wells RHWM01, RHWM02, RHMW03, and RHMW05, and sampling point RHMW2254-01. Samples were collected in February, May, July, and October of 2009. The COPCs with concentrations exceeding current DOH EALs are summarized below. In addition, the Groundwater Protection Plan was revised.

- RHMW01 TPH-d and 1-methylnaphthalene were detected at concentrations above the DOH EALs. The TPH-d concentrations were below the SSRBL.
- RHMW02 TPH-d, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were
 detected at concentrations above the DOH EALs. The TPH-d concentrations were below the
 SSRBL.
- RHMW03 TPH-d was detected at a concentration above the DOH EAL, but below the SSRBL.
- RHMW05 TPH-d was detected at a concentration above the DOH EAL, but below the SSRBL.

In 2010, groundwater samples were collected from wells RHWM01, RHWM02, RHMW03, and RHMW05, and sampling point RHMW2254-01. Samples were collected in January, April, July, and October. The COPCs with concentrations exceeding current DOH EALs are summarized below.

- RHMW01 TPH-d was detected at concentrations above the DOH EAL, but below the SSRBL.
- RHMW02 TPH-g, TPH-d, naphthalene, and 1-methylnaphthalene were detected at concentrations above the DOH EALs. The TPH-d concentrations were below the SSRBL.
- RHMW03 TPH-d was detected at a concentration above the DOH EAL, but below the SSRBL.
- RHMW05 TPH-d was detected at a concentration above the DOH EAL, but below the SSRBL.

In 2011, quarterly groundwater samples were collected from wells RHWM01, RHWM02, RHMW03, and RHMW05, and sampling point RHMW2254-01. Samples were collected in January, April, July, and October. In a Fall 2011 update, the DOH EALs were revised. The drinking water toxicity EAL for TPH-d decreased from 210 to 190 μ g/L (DOH, 2011). The COPCs with concentrations exceeding current DOH EALs are summarized below.

- RHMW01 TPH-d was detected at concentrations above the DOH EAL, but below the SSRBL.
- RHMW02 TPH-d, naphthalene, indeno[1,2,3-cd]pyrene, and 1-methylnaphthalene were
 detected at concentrations above the DOH EALs. The TPH-d concentrations were below the
 SSRBL.

In 2012, quarterly groundwater samples were collected from wells RHWM01, RHWM02, RHMW03, and RHMW05, and sampling point RHMW2254-01. Samples were collected in February, April, July, and November. The COPCs with concentrations exceeding current DOH EALs are summarized below.

 RHMW01 – TPH-d was detected at concentrations above the DOH EAL, but below the SSRBL. RHMW02 – TPH-d, TPH-g, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were detected at concentrations above the DOH EALs. The TPH-d concentrations were below the SSRBL.

In 2013, quarterly groundwater samples were collected from wells RHWM01, RHWM02, RHMW03, and RHMW05, and sampling point RHMW2254-01. Samples were collected in January, April, July, and October. The COPCs with concentrations exceeding current DOH EALs are summarized below.

- RHMW01 TPH-d was detected at concentrations above the DOH EAL, but below the SSRBL.
- RHMW02 TPH-d, TPH-g, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were detected at concentrations above the DOH EALs. The TPH-d concentrations were below the SSRBL.

In January 2014, quarterly groundwater samples were collected from wells RHMW01, RHMW02, RHMW03, RHMW05, and sampling point RHMW2254-01. The COPCs with concentrations exceeding current DOH EALs are summarized below.

- RHMW01 TPH-d was detected at a concentration above the DOH EAL, but below the SSRBL.
- RHMW02 TPH-d, naphthalene, and 1-methylnaphthalene were detected at concentrations above the DOH EALs. The TPH-d concentrations exceeded the SSRBL.

Between January and April 2014, additional groundwater sampling was conducted at wells RHMW01, RHMW02, RHMW05, and sampling point RHMW2254-01 in response to a suspected release from Tank 5. The COPCs with concentrations exceeding current DOH EALs are summarized below.

- RHMW01 TPH-d was detected at concentrations above the DOH EAL, but below the SSRBL.
- RHMW02 TPH-d, naphthalene, and 1-methylnaphthalene were detected at concentrations above the DOH EALs. The TPH-d concentrations were below the SSRBL.

In April 2014, quarterly groundwater samples were collected from wells RHMW01, RHMW02, RHMW03, RHMW05, and sampling point RHMW2254-01. The COPCs with concentrations exceeding current DOH EALs are summarized below.

 RHMW02 – TPH-d and naphthalene were detected at concentrations above both DOH EALs. 1-Methylnaphthalene was detected at concentrations above the DOH EAL for drinking water toxicity. The TPH-d concentrations were below the SSRBL.

In May and June 2014, additional groundwater sampling was conducted at wells RHMW01, RHMW02, RHMW05, and sampling point RHMW2254-01 in response to a reported release

from Tank 5. The COPCs with concentrations exceeding current DOH EALs are summarized below.

• RHMW02 – TPH-d, naphthalene, and 1-methylnaphthalene were detected at concentrations above the DOH EALs. The TPH-d concentrations were below the SSRBL.

1.3.1 Previous Reports

The following groundwater monitoring reports were previously submitted to the DOH:

- 1. Groundwater Sampling Report, First Quarter 2005 (submitted April 2005).
- 2. Groundwater Sampling Report, Second Quarter 2005 (submitted August 2005).
- Groundwater Sampling Report, Third Quarter 2005 (submitted November 2005).
- 4. Groundwater Sampling Report, Fourth Quarter 2005 (submitted February 2006).
- 5. Groundwater Monitoring Results, July 2006 (submitted September 2006).
- Groundwater Monitoring Results, December 2006 (submitted January 2007).
- 7. Groundwater Monitoring Results, March 2007 (submitted May 2007).
- 8. Groundwater Monitoring Results, June 2007 (submitted August 2007).
- 9. Groundwater Monitoring Results, September 2007 (submitted October 2007).
- 10. Groundwater Monitoring Report, January 2008 (submitted March 2008).
- 11. Groundwater Monitoring Report, April 2008 (submitted May 2008).
- 12. Groundwater Monitoring Report, July 2008 (submitted October 2008).
- 13. Groundwater Monitoring Report, October and December 2008 (submitted February 2009).
- 14. Groundwater Monitoring Report, February 2009 (submitted May 2009).
- 15. Groundwater Monitoring Report, May 2009 (submitted July 2009).
- 16. Groundwater Monitoring Report, July 2009 (submitted September 2009).
- 17. Groundwater Monitoring Report, October 2009 (submitted December 2009).
- 18. Groundwater Monitoring Report, January, February, and March 2010 (submitted April 2010).
- 19. Groundwater Monitoring Report, April 2010 (submitted May 2010).

- 20. Groundwater Monitoring Report, July 2010 (submitted August 2010).
- 21. Groundwater Monitoring Report, October 2010 (submitted December 2010).
- 22. Groundwater Monitoring Report, January 2011 (submitted March 2011).
- 23. Groundwater Monitoring Report, April 2011 (submitted June 2011).
- 24. Groundwater Monitoring Report, July 2011 (submitted September 2011).
- 25. Groundwater Monitoring Report, October 2011 (submitted December 2011).
- 26. Groundwater Monitoring Report, January-February 2012 (submitted March 2012).
- 27. Groundwater Monitoring Report, April 2012 (Submitted July 2012).
- 28. Groundwater Monitoring Report, October 2012 (Submitted January 2013).
- 29. Groundwater Monitoring Report, January 2013 (Submitted April 2013).
- 30. Groundwater Monitoring Report, April 2013 (Submitted July 2013).
- Groundwater Monitoring Report, July 2013 (Submitted September 2013).
- 32. Groundwater Monitoring Report, October 2013 (Submitted January 2014).
- 33. Groundwater Sampling Report for Additional Sampling, January 2014 (submitted January 2014).
- 34. Groundwater Monitoring Report, January 2014 (Submitted April 2014).
- 35. Groundwater Sampling Report for Tank 5 Release Response on March 5 and 6, 2014 (submitted March 2014).
- 36. Groundwater Sampling Report for Tank 5 Release Response on March 10, 2014 (submitted March 2014).
- 37. Groundwater Sampling Report for Tank 5 Release Response on March 25 and 26, 2014 (submitted April 2014).
- 38. Groundwater Sampling Report for Tank 5 Release Response on April 7, 2014 (submitted April 2014).
- 39. Groundwater Monitoring Report, April 2014 (Submitted June 2014).
- 40. Groundwater Sampling Report for Tank 5 Release Response on May 27 and 28, 2014 (submitted June 2014).

41. Groundwater Sampling Report for Tank 5 Release Response on June 23 and 24, 2014 (submitted July 2014).

SECTION 2 – GROUNDWATER SAMPLING

On July 21 and 22, 2014, ESI personnel collected groundwater samples from four monitoring wells at the RHSF (wells RHMW01, RHMW02, RHMW03, and RHMW05) and one sampling point at Red Hill Shaft (RHMW2254-01). The samples were collected in accordance with the 2012 WP/SAP. The WP/SAP is consistent with DOH UST release response requirements (DOH, 2000); DoN Procedure I-C-3, *Monitoring Well Sampling* (DoN, 2007); and the RHSF Groundwater Protection Plan (TEC, 2008). Prior to purging and sampling, the depth to groundwater and the depth to the bottoms of the wells were measured using a Geotech oil/water interface probe. No measurable product, sheen, or petroleum hydrocarbon odor was detected in any of the wells with the exception of RHMW02. A moderate petroleum hydrocarbon odor was noticed when collecting groundwater samples from RHMW02.

2.1 GROUNDWATER SAMPLING

Prior to collecting groundwater samples, the monitoring wells were purged of standing water in the well casings. Each well contains a dedicated bladder pump which was used to purge the well and to collect samples. To operate the pump, a portable air compressor with an in-line filter was connected to a QED MP50 MicroPurge® Basics Controller box, which was then connected to the pump. The compressor was turned on to power the pump and the controller was used to adjust the pumping rate to less than one liter of water per minute.

Water quality parameters were monitored on a periodic basis during well purging. The water quality parameters that were measured included hydrogen activity [pH], temperature, conductivity, dissolved oxygen, and oxidation reduction potential. The water quality parameters were evaluated to assess whether the natural characteristics of the aquifer formation water were present within the monitoring wells before collecting the samples. At least four readings were collected during the purging process. Purging was considered complete when at least three consecutive water quality measurements stabilized within approximately 10%. The readings were recorded on groundwater monitoring logs. The groundwater monitoring logs are included in Appendix A. In addition, field notes were taken to document the sampling event. The field notes are included in Appendix B.

When the water quality parameters stabilized, groundwater samples were collected from the wells using the bladder pumps. The groundwater samples were collected no more than two hours after purging was completed to decrease groundwater interaction with the monitoring well casing and atmosphere. Prior to collecting the sample, the water level in the monitoring wells was measured and recorded to ensure that excessive drawn down had not occurred. The groundwater samples were collected at flow rates of approximately 0.17 to 0.5 liters per minute. Samples collected for dissolved lead analysis were filtered in the field using new 0.45 micron filters.

2.2 ANALYTICAL RESULTS

The samples were analyzed for TPH-d using U.S. Environmental Protection Agency [EPA] Method 8015M, TPH-g and Volatile Organic Compounds [VOCs] using EPA Method 8260B, PAHs using EPA Method 8270C SIM, dissolved lead using EPA Method 6020, and total lead using EPA Method 200.8. The sample collected from sampling point RHMW2254-01 was analyzed for total lead (unfiltered) as DON Well 2254-01 is a drinking water supply well. The analytical results are described below and summarized in Table 2.1. A copy of the laboratory report is included in Appendix C. Analytical results were compared to the DOH EALs for drinking water toxicity and gross contamination and to the SSRBLs established in the RHSF Final Groundwater Protection Plan (TEC, 2008).

- RHMW01 TPH-d (67 μg/L) was the only analyte detected. The TPH-d concentration detected did not exceed the DOH EALs or the SSRBL.
- RHMW02 TPH-d (1,200 and 1,300 μg/L), TPH-g (48 and 49 μg/L), xylenes (0.36 and 0.33 μg/L), acenaphthene (0.52 and 0.50 μg/L), fluorene (0.24 and 0.23 μg/L), 1-methylnaphthalene (25 and 26 μg/L), 2-methylnaphthalene (20 and 22 μg/L), and naphthalene (71 and 76 μg/L) were detected. TPH-d, 1-methylnaphthalene, and naphthalene were detected at concentrations above their respective DOH EALs for both drinking water toxicity and gross contamination. However, the TPH-d concentrations did not exceed the SSRBL. 2-Methylnaphthalene was detected at concentrations above the DOH EAL for gross contamination.
- RHMW03 TPH-d (37 μg/L) was the only analyte detected. None of the chemical constituents analyzed for were detected at concentrations above he DOH EALs or the SSRBL.
- RHMW05 None of the chemical constituents analyzed for were detected.
- RHMW2254-01 None of the chemical constituents analyzed for were detected.

Acetone (6.5 μ g/L) was detected in the trip blank submitted on July 21, 2014. Acetone was not detected in any of the groundwater samples, and this is not likely to affect data usability.

2.3 GROUNDWATER CONTAMINANT TRENDS

The historical groundwater contaminant concentration trends for COPCs that exceeded the DOH EALs or SSRBLs are illustrated in Appendix D. A summary of groundwater contaminant trends is provided below.

 RHMW01 – COPCs detected during this round of quarterly sampling are consistent with the historical data for RHMW01. TPH-d has historically been detected at concentrations above the DOH EAL for both drinking water toxicity and gross contamination. TPH-d concentrations have shown an overall decreasing trend from a high of 1,500 μ g/L in February 2005. The TPH-d concentration was last above the DOH EAL for gross contamination in a sample collected on April 7, 2014.

- RHMW02 COPCs detected during this round of quarterly sampling are consistent with the historical data for RHMW02. TPH-q, TPH-d, trichloroethylene, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene have historically been detected at concentrations above the DOH EALs. TPH-d concentrations increased sharply from 2,400 µg/L to 5,100 µg/L during the additional sampling event on January 15, 2014, exceeding the SSRBL of 4,500 µg/L. During this July 2014 event, TPH-d concentrations decreased to an average of EALs. 1,250 µg/L but remained above both DOH The concentrations 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene increased to their highest levels since January 2013. The concentrations of TPH-g remained below the DOH EALs for gross contamination and drinking water toxicity. Trichloroethylene has not been detected in RHMW02 since September 2005.
- RHMW03 COPCs detected during this round of quarterly sampling are consistent with the historical data for RHMW03. TPH-d has historically been detected at concentrations above the DOH EALs; however, it has not been detected at concentrations above the DOH EALs since October 2010.
- RHMW05 No COPCs were detected during this round of quarterly sampling. TPH-d has
 historically been detected in RHMW05 at concentrations above the DOH EAL for both
 drinking water toxicity and gross contamination; however, it has not been detected at
 concentrations above the DOH EALs since January 2010.
- RHMW2254-01 No COPCs were detected during this round of quarterly sampling. TPH-d was last detected in RHMW2254-01 at a concentration above the DOH EAL for gross contamination in January 2008. Although the method reporting limits for TPH-d exceeded one or both DOH EALs between May 2009 and July 2010, TPH-d has not been detected at concentrations above the DOH EALs since January 2008.

Historical groundwater contaminant trends for concentrations above the DOH EALs for both drinking water toxicity and gross contamination are illustrated in Appendix D.

2.4 WASTE DISPOSAL

The purged groundwater and decontamination water generated during sampling of the inside tunnel wells were stored in a 55-gallon drum along with the purged water and decontamination water from the outside tunnel wells. The drum is currently stored onsite at ADIT 3 on top of a secondary containment spill pallet and covered by a tarp. There is a non-hazardous label affixed to the drum with all pertinent information relating to its generation. The drum will be used for future sampling events and will be properly disposed of once it has been filled.

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TABLE 2.1 Analytical Results for Groundwater Sampling (July 21 and 22, 2014) Red Hill Bulk Fuel Storage Facility July 2014 Quarterly Monitoring Report

		DOH	EALs		RHMW22	54-01 (ES	S107)			RHWN	101 (ES1	03)				W02 (ES	104)			RHWM	03 (ES10	06)			RHMV	05 (ES10	8)
Method	Chemical	Drinking Water	Gross	Results	O	LOQ	LOD	DL	Results	Q	Log	LOD	DL	Results	a	LOQ	LOD	DL	Results	a	Log	LOD	DL	Results		LOQ	LOD DL
EDA 0045D	TDU	Toxicity	Contamination													1											
EPA 8015B EPA 8260B	TPH-d TPH-g	190 100	100 100	N.D. N.D.	U	25 50	12 30	7.4 26	67 N.D.	HD U	25 50	30	7.4	1,200 48	HD J	25 50	30	7.4	37 N.D.	HD U	25 50	30	7.4	N.D.	U	25 50	12 7.4 30 26
LITTOLGGE	Acenaphthene	370	20	N.D.	Ü	0.2	0.048	0.020	N.D.	Ū	0.2	0.051	0.021	0.52	 	0.2	0.048	0.021	N.D.	Ü	0.2	0.047	0.020	N.D.	Ū	0.2	0.049 0.021
	Acenaphthylene	240	2,000	N.D.	U	0.2	0.048	0.018	N.D.	U	0.2	0.051	0.018	N.D.	U	0.2	0.048	0.018	N.D.	U	0.2	0.047	0.018	N.D.	U	0.2	0.049 0.018
	Anthracene	1,800	22	N.D.	U	0.2	0.048	0.034	N.D.	<u>U</u>	0.2	0.051	0.034	N.D.	U U	0.2	0.048	0.035	N.D.	U	0.2	0.047	0.034	N.D.	<u> </u>	0.2	0.049 0.035
	Benzo[a]anthracene Benzo[g,h,i]perylene	0.092 1,500	4.7 0.13	N.D. N.D.	U	0.2	0.048	0.023 0.022	N.D. N.D.	U	0.2	0.051	0.024	N.D.	U	0.2	0.048	0.024	N.D.	U	0.2	0.047	0.023	N.D. N.D.	U	0.2	0.049 0.024 0.049 0.022
50 00 00	Benzo[a]pyrene	0.2	0.13	N.D.	Ü	0.2	0.048	0.036	N.D.	<u>U</u>	0.2	0.051	0.022	N.D.	 	0.2	0.048	0.022	N.D.	U	0.2	0.047	0.036	N.D.		0.2	0.049 0.037
	Benzo[b]fluoranthene	0.092	0.75	N.D.	U	0.2	0.048	0.025	N.D.	U	0.2	0.051	0.025	N.D.	U	0.2	0.048	0.025	N.D.	U	0.2	0.047	0.025	N.D.	U	0.2	0.049 0.025
	Benzo[k]fluoranthene	0.92	0.4	N.D.	U	0.2	0.048	0.023	N.D.	U	0.2	0.051	0.024	N.D.	U	0.2	0.048	0.024	N.D.	U	0.2	0.047	0.023	N.D.	U	0.2	0.049 0.024
EPA 8270C	Chrysene	9.2 0.0092	0.52	N.D. N.D.	U	0.2	0.048 0.048	0.019 0.026	N.D. N.D.	U	0.2	0.051	0.019	N.D.	U	0.2	0.048	0.019	N.D. N.D.	U	0.2	0.047	0.019	N.D. N.D.	U	0.2	0.049 0.019 0.049 0.027
	Dibenzo[a,h]anthracene ' Fluoranthene	1,500	130	N.D.	U	0.2	0.048	0.026	N.D.	U	0.2	0.051	0.027	N.D.	1 0	0.2	0.048	0.027	N.D.	U	0.2	0.047	0.020	N.D.	U	0.2	0.049 0.027
	Fluorene	240	950	N.D.	Ü	0.2	0.048	0.024	N.D.	Ū	0.2	0.051	0.025	0.24	 	0.2	0.048	0.025	N.D.	Ü	0.2	0.047	0.024	N.D.	Ū	0.2	0.049 0.025
	Indeno[1,2,3-cd]pyrene	0.092	0.095	N.D.	U	0.2	0.048	0.022	N.D.	U	0.2	0.051	0.022	N.D.	U	0.2	0.048	0.022	N.D.	U	0.2	0.047	0.022	N.D.	U	0.2	0.049 0.022
	1-Methylnaphthalene	4.7	10	N.D.	U	0.2	0.048	0.028	N.D.	U	0.2	0.051	0.029	25		0.2	0.96	0.029	N.D.	U	0.2	0.047	0.028	N.D.	<u>U</u>	0.2	0.049 0.029
	2-Methylnaphthalene Naphthalene	24 17	10 21	N.D. N.D.	U	0.2	0.048 0.048	0.026 0.023	N.D. N.D.	U	0.2	0.051 0.051	0.027	20 71	-	2.0	0.96	0.027	N.D. N.D.	U	0.2	0.047	0.027	N.D.	U	0.2	0.049 0.027 0.049 0.023
	Phenanthrene	240	410	N.D.	Ü	0.2	0.048	0.023	N.D.	U	0.2	0.051	0.023	N.D.	U	0.2	0.048	0.031	N.D.	U	0.2	0.047	0.023	N.D.	U	0.2	0.049 0.023
	Pyrene	180	68	N.D.	Ü	0.2	0.048	0.024	N.D.	Ū	0.2	0.051	0.025	N.D.	Ū	0.2	0.048	0.025	N.D.	Ū	0.2	0.047	0.024	N.D.	Ū	0.2	0.049 0.025
	1,1,1,2-Tetrachloroethane	0.52	50,000	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5 0.4
	1,1,2,2-Tetrachloroethane	0.067 200	500 970	N.D. N.D.	U	1 5	0.5 0.5	0.41 0.3	N.D. N.D.	U	5	0.5	0.41	N.D.	U	1 5	0.5	0.41	N.D. N.D.	U	5	0.5 0.5	0.41	N.D.	U	5	0.5 0.41 0.5 0.3
	1,1,2-Trichloroethane	5	50,000	N.D.	U	1	0.5	0.38	N.D.	U	1	0.5	0.38	N.D.	 	1 1	0.5	0.38	N.D.	U	1	0.5	0.38	N.D.	U	1	0.5 0.38
	1,1-Dichloroethane	2.4	50,000	N.D.	Ū	5	0.5	0.28	N.D.	Ū	5	0.5	0.28	N.D.	Ū	5	0.5	0.28	N.D.	U	5	0.5	0.28	N.D.	Ū	5	0.5 0.28
	1,1-Dichloroethylene	7	1,500	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5 0.43
	1,2,3-Trichloropropane 1,2,4-Trichlorobenzene	0.6 70	50,000	N.D.	U	5	1	0.64	N.D.	U	5	1 1	0.64	N.D.	U	5 5	1 1	0.64	N.D.	U	5	1 1	0.64	N.D.	U	5	1 0.64
	1,2-Dibromo-3- chloropropane	0.04	3,000 10	N.D. N.D.	U	5 10	2	0.5 1.2	N.D. N.D.	U	10	2	1.2	N.D.	1 0	10	2	0.5 1.2	N.D. N.D.	U	5 10	2	1.2	N.D.	U	5 10	1 0.5 2 1.2
	1,2-Dibromoethane ¹	0.04	50,000	N.D.	Ü	1	0.5	0.24	N.D.	 Ū	1	0.5	0.24	N.D.	 ŭ	1 1	0.5	0.24	N.D.	Ü	1	0.5	0.24	N.D.		1	0.5 0.24
	1,2-Dichlorobenzene	600	10	N.D.	U	1	0.5	0.46	N.D.	U	1	0.5	0.46	N.D.	U	1	0.5	0.46	N.D.	U	1	0.5	0.46	N.D.	U	1	0.5 0.46
	1,2-Dichloroethane	0.15 5	7,000	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	N.D.	U	1 5	0.5	0.24	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5 0.24
	1,2-Dichloropropane 1,3-Dichlorobenzene	180	10 5	N.D. N.D.	U	5	0.5 0.5	0.42 0.4	N.D. N.D.	U	5	0.5	0.42	N.D.	U	5	0.5	0.42	N.D.	U	5	0.5 0.5	0.42	N.D. N.D.	U	5	0.5 0.42 0.5 0.4
	1,3-Dichloropropene (total of	0.43	50,000	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25	N.D.	U	1 1	0.5	0.25	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5 0.25
	cis/trans)					'					<u> </u>	ļ	ļ		↓	 '	ļ				,		↓	ļ		<u> </u>	
	1,4-Dichlorobenzene Acetone	75 22,000	5 20.000	N.D. N.D.	U.ICH	20	0.5 10	0.43 6	N.D.	U,ICH	20	0.5 10	0.43	N.D.	U.ICH	20	0.5	0.43	N.D.	U.ICH	20	0.5	0.43	N.D.	U.ICH	20	0.5 0.43 10 6
	Benzene	5	170	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5 0.14
	Bromodichloromethane ¹	0.12	50,000	N.D.	U	5	0.5	0.21	N.D.	U	5	0.5	0.21	N.D.	U	5	0.5	0.21	N.D.	U	5	0.5	0.21	N.D.	U	5	0.5 0.21
8	Bromoform	80	510	N.D.	U	10	1	0.5	N.D.	U	10	1	0.5	N.D.	U	10	1 1	0.5	N.D.	U	10	1	0.5	N.D.	U	10	1 0.5
EPA 8260B	Bromomethane Carbon Tetrachloride	8.7 5	50,000 520	N.D. N.D.	U	20	0.5	3.9 0.23	N.D. N.D.	U	20	0.5	0.23	N.D.	U	20	0.5	0.23	N.D.	U	20	0.5	0.23	N.D. N.D.	U	20	5 3.9 0.5 0.23
	Chlorobenzene	100	50	N.D.	Ü	5	0.5	0.17	N.D.	Ū	5	0.5	0.17	N.D.	l ü	5	0.5	0.17	N.D.	U	5	0.5	0.17	N.D.	Ū	5	0.5 0.17
	Chloroethane	21,000	16	N.D.	U	10	5	2.3	N.D.	U	10	5	2.3	N.D.	U	10	5	2.3	N.D.	U	10	5	2.3	N.D.	U	10	5 2.3
	Chloroform	70	2,400	N.D.	U	5	0.5	0.46	N.D.	U	5	0.5	0.46	N.D.	U	5	0.5	0.46	N.D.	U	5	0.5	0.46	N.D.	U	5	0.5 0.46
50 00 00	Chloromethane cis-1,2-Dichloroethylene	1.8 70	50,000 50,000	N.D. N.D.	U, IJ U	10	0.5	1.8 0.48	N.D. N.D.	U, IJ U	10	0.5	1.8 0.48	N.D.	U, IJ U	10	0.5	0.48	N.D.	U, IJ U	10	0.5	1.8 0.48	N.D.	U, IJ U	10	2 1.8 0.5 0.48
	Dibromochloromethane ¹	0.16	50,000	N.D.	U	1	0.5	0.46	N.D.	U	1	0.5	0.46	N.D.	l ü	1 1	0.5	0.46	N.D.	U	1	0.5	0.46	N.D.		1	0.5 0.48
	Ethylbenzene	700	30	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14	N.D.	J	1	0.5	0.14	N.D.	J	1	0.5	0.14	N.D.	U	1	0.5 0.14
	Hexachlorobutadiene	0.86	6	N.D.	U	1	0.5	0.32	N.D.	U	1	0.5	0.32	N.D.	U	1	0.5	0.32	N.D.	U	1	0.5	0.32	N.D.	U	1	0.5 0.32
	Methyl ethyl ketone (2- Butanone)	7,100	8,400	N.D.	U	10	5.0	2.2	N.D.	U	10	5.0	2.2	N.D.	U	10	5.0	2.2	N.D.	U	10	5.0	2.2	N.D.	U	10	5.0 2.2
	Methyl isobutyl ketone (4-	2,000	1300	N.D.	U	10	5.0	4.4	N.D.	U	10	5.0	4.4	N.D.	U	10	5.0	4.4	N.D.	U	10	5.0	4.4	N.D.	U	10	5.0 4.4
	Methyl fort butyl Ethor	"									1										1					1	
	Methyl tert-butyl Ether Methylene chloride	12 4.8	5 9.100	N.D. N.D.	U	1 5	0.5 1.0	0.31 0.64	N.D. N.D.	U	5	0.5 1.0	0.31	N.D.	U	5	1.0	0.31	N.D. N.D.	U	5	0.5 1.0	0.31	N.D.	U	5	0.5 0.31 1.0 0.64
	Styrene	100	10	N.D.	Ü	1	0.5	0.17	N.D.	Ü	1	0.5	0.17	N.D.	 	1 1	0.5	0.17	N.D.	Ū	1	0.5	0.17	N.D.	U	1	0.5 0.17
	Tetrachloroethylene	5	170	N.D.	U	5	0.5	0.39	N.D.	U	5	0.5	0.39	N.D.	U	5	0.5	0.39	N.D.	U	5	0.5	0.39	N.D.	U	5	0.5 0.39
	Toluene	1,000	40	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	N.D.	U	1 1	0.5	0.24	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5 0.24
	trans-1,2- Dichloroethylene Trichloroethylene	100 5	260 310	N.D. N.D.	U	1	0.5 0.5	0.37 0.37	N.D. N.D.	U	1 1	0.5 0.5	0.37	N.D.	U	1 1	0.5	0.37	N.D. N.D.	U	1	0.5	0.37	N.D. N.D.	U	1	0.5 0.37 0.5 0.37
	Vinyl chloride	2	3,400	N.D.	U	1	0.5	0.37	N.D.	U	1	0.5	0.37	N.D.	T U	1 1	0.5	0.37	N.D.	U	1	0.5	0.37	N.D.	U	1	0.5 0.3
	Xylenes	10,000	20	N.D.	Ū	11	1.5	0.23	N.D.	U	1	0.5	0.23	0.36	J	1	0.5	0.23	N.D.	Ū	1	0.5	0.23	N.D.	U	11	1.5 0.23
EPA 6020	Dissolved Lead	15	50,000	-	-	-	-	-	N.D.	U	1	0.2	0.0898	N.D.	U	1	0.2	0.0898	N.D.	U	1	0.2	0.0898	N.D.	U	1	0.2 0.0898
EPA 200.8	Total Lead	15	50,000	N.D.	U	1.0	-	0.0898	-	-	_	_		-		-	-	-	-	-	-	-	-		-	-	-

The data are in micrograms per liter (μ g/L). Shaded values exceeded the DOH EALs. LOD for this analyte exceeds the DOH EAL Not Analyzed

DL DOH EALS EPA HD ICH ICJ

Not Analyzed
This sample was analyzed by EPA Method 200.8 and therefore does not have an LOD
Detection Limit or Method Detection Limit (MDL)
DOH Tier 1 Environmental Action Levels for groundwater where groundwater is a current drinking water source and surface water is greater than 150 meters from the site (DOH, Fall 2011).
Environmental Protection Agency
The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
Initial calibration verification recovery is above the control limit for this analyte.
Initial calibration verification recovery is below the control limit for this analyte.

Analyte was detected at a concentration below the LOQ and above the DL. Reported value is estimated.

J LOD LOQ N.D. Q TPH-d TPH-g U

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Red Hill LTM, 3Q2014 Status Report Inside Tunnel Wells

Analyte was detected at a concentration below the LOQ a Limit of Detection Limit of Quantitation Not Detected Qualifiers Total Petroleum Hydrocarbons as diesel Total Petroleum Hydrocarbons as gasoline Undetected at DL and is reported as less than the LOD.

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SECTION 3 – DATA QUALITY ASSESSMENT

A data quality assessment, which consists of a review of the overall groundwater sample collection and analysis process, was performed in order to determine whether the analytical data generated met the quality objectives for the project. The data quality assessment was performed in accordance with the approved WP/SAP (ESI, 2012). The field quality control program consisted of standardized sample collection and management procedures, and the collection of field duplicate samples, matrix spike samples, and trip blank samples. The laboratory quality assurance program consisted of the use of standard analytical methods and the preparation and analyses of Matrix Spike [MS]/Matrix Spike Duplicate [MSD] samples, surrogate spikes, blanks, and Laboratory Control Samples [LCSs]/Laboratory Control Sample Duplicates [LCSDs].

3.1 DATA VALIDATION AND ASSESSMENT

The objective of data validation is to provide data of known quality for project decisions. Data quality is judged in terms of Precision, Accuracy, Representativeness, Completeness, Comparability, and Sensitivity [PARCCS]. A number of factors may affect the quality of data, including: sample collection methods, sample analysis methods, and adherence to established procedures for sample collection, preservation, management, shipment, and analysis.

Precision

Precision is defined as the reproducibility of replicate measurements. Precision is evaluated by Relative Percentage Difference [RPD] of field duplicates, LCS/LCSDs, and MS/MSD results. Field duplicate and MS/MSD samples were collected at a rate of approximately 10% of primary samples. Field duplicates were sent to the laboratory along with the primary samples.

The RPDs of detected analytes for the primary and field duplicate samples (ES104 and ES105) are provided in Table 3.1. A precision of less than 50% for duplicate pairs is required by the DoN Project Procedures Manual to be considered acceptable (DoN 2007). All duplicate RPDs are less than the acceptable maximum, except for lead. An RPD of 200% was assigned to the ES104 and ES105 lead results because lead was detected in only one of the replicate samples from the duplicate pair. The lead result for sample ES105 was below the LOQ; consequently, the RPD exceedance signified the anticipated decrease in precision below the LOQ, but was not indicative of a QC issue.

Lead was detected in only the duplicate sample ES105, and was assigned an RPD of 200%. However, the concentration detected was below the limit of quantitation [LOQ] and well below the DOH EALs. Therefore, it is unlikely to have an effect on data usability, and the data precision is considered acceptable. In addition, all RPDs for MS/MSD and LCS/LCSD pairs were also below the control limit.

Accuracy

Accuracy is defined as the degree of conformity of a measurement to a standard or true value. Accuracy is evaluated through measurement of the percent recovery of an analyte in a reference standard or spiked sample. Accuracy limits for surrogates, laboratory control spike, MS, and MSD samples are established by the individual laboratory.

Between July 2006 and July 2010, naphthalene was analyzed for by both EPA Methods 8260B and 8270C, and both results were reported. In September 2005 and in all data beginning in October 2010, only results using EPA Method 8270C were reported. Naphthalene has historically only been detected at concentrations above the DOH EALs in well RHMW02. In this well, concentrations of naphthalene detected in each sample by EPA Method 8260B were generally two to three times higher than those detected by EPA Method 8270C. We assume this is due to the better preservation of VOCs associated with the use of EPA Method 8260B. This suggests that the naphthalene results provided by EPA Method 8270C may be biased low. Since October 2012, naphthalene concentrations in RHMW02 have exceeded DOH EALs for both gross contamination and drinking water toxicity. The naphthalene concentration detected in July 2012 (17 μg/L) was equal to the DOH EAL for drinking water (17 μg/L) but below the DOH EAL for gross contamination (21 µg/L); it is possible that accounting for the low bias, the actual naphthalene concentration detected in July exceeded both EALs. Naphthalene concentrations between April 2011 and April 2012 were all an order of magnitude below both EALs, and it is unlikely that naphthalene concentrations in these samples exceeded the EALs, even after accounting for a potential low bias.

Results for TPH-d in samples ES103 through ES106 were flagged "HD." The laboratory indicated a mismatch between the calibration standard and the TPH-d chromatographic profile. Mismatches of this type are not uncommon. Even though chromatograms are not part of the standard laboratory package, ESI was able to review the chromatograms from RHMW02 dating back to October 2012. The chromatograms of groundwater samples from RHMW02 did not significantly differ between each event, but did not match a standard chromatogram of JP-8 in groundwater.

For this July 2014 sampling event, all of the LCS and surrogate spike recoveries for analyzed constituents were within acceptable percent recovery limits, except for the LCS percent recovery for acetone, which was above the recovery limit. This indicates acetone results may be biased high; however, acetone was only detected in the trip blank and not in any of the groundwater samples.

The MS and/or MSD recoveries were above the control limits for acetone and lead and the associated sample results may be biased high. Acetone was not detected in any of the groundwater samples and lead was only detected in ES105, at a concentration below the LOQ. Naphthalene, 2-methylnaphthalene and 1-methylnaphthalene concentrations for ES104, the primary sample on which the MS/MSD were performed, were significantly higher than the added spike concentration, which prevented an accurate evaluation of the MS/MSD recovery for these analytes.

All other MS/MSD recoveries were within acceptable recovery limits; therefore, the data accuracy for this monitoring event is considered acceptable.

Representativeness

Representativeness is the degree that data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness was achieved by conducting sampling in accordance with the sample collection procedures described in the project WP/SAP, including standardized sample collection methods (ESI, 2012).

Representativeness is also evaluated through the compliance with the standardized sample holding time and sample preservation methods, and through the analysis of blank samples, including method blank and trip blank samples. For this sampling event, all sample holding time and sample preservation were consistent with EPA guidance.

For this sampling event, one trip blank was included in every cooler containing samples for VOC and TPH-g analysis to assess the potential for contamination during sample transport. Two trip blanks were collected. Acetone was the only COPC detected, and in only one of the trip blanks; however, acetone was not detected in any of the groundwater samples, excluding the possibility that project samples were contaminated with acetone during handling or transport. Based on the assessment of representativeness, the groundwater sample data are considered representative of the groundwater quality on site. The trip blank results are provided in Table 3.1.

Completeness

Completeness is defined as the overall percentage of valid analytical results (including estimated results) compared to the total number of analytical results reported by the analytical laboratory. No data were rejected for this project, and therefore the completeness goal for this project (90%), was successfully met.

Comparability

Comparability expresses the confidence with which one data set can be compared to another data set. Comparability can be related to accuracy and precision because these quantities are measures of data reliability. Data with acceptable precision and accuracy are considered comparable if collection techniques, analytical procedures, methods and reporting are equivalent.

As noted above, between July 2006 and July 2010, naphthalene was analyzed for using both EPA Methods 8260B and 8270C, and in September 2005 and between October 2010 and the most recent event, only results using EPA Method 8270C were reported. In general, EPA Method 8260B resulted in higher, and as discussed above, likely more accurate, results than EPA Method 8270C. However, for the sake of comparability with results from recent events, EPA Method 8270C was used for naphthalene analysis in this event. Consequently, the low bias associated with Method 8270C should be considered when making project decisions.

3-3

All project samples for TPH-g analysis through July 2010 were analyzed by EPA Method 8015; beginning in October 2010, EPA Method 8260B was used. There was no event where both methods were used; consequently, there is no way to directly compare the results obtained by method and to assess potential bias. However, there is no reason to believe that using either method should bias the data, and the TPH-g data for all events should be comparable.

Other than the naphthalene bias discussed above, no issues with comparability were identified. The results are considered comparable within this data set and with the data collected from recent sampling events.

Sensitivity

The LOQs are established by the laboratory based on the limits of detection [LODs] or instrument detection limits, historical data, and EPA limits established for the various methods. The LOQs for samples may require adjustment by the laboratory due to matrix interference or if high levels of target analytes necessitate dilution before analysis. Matrix interference and sample dilutions have the effect of decreasing sensitivity and increasing the LOQs. Laboratory LODs and LOQs for several analytes (EPA Methods 8260 and 8270) for this event differed from the LODs and LOQs in the WP/SAP because the laboratory updates them quarterly and in some cases, dilution was necessary due to the presence of high concentrations of analytes.

For this event, LODs and LOQs for several analytes were greater than the DOH EALs (as stated in the WP/SAP), and therefore it would not be possible to detect the analytes at concentrations greater than the DOH EALs but below the LODs or LOQs. The lack of the required sensitivity should be considered when making project decisions. The affected analytes for this monitoring event are 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane, 1,2-dichloroethane, 1,3-dichloropropene, bromodichloromethane, chloromethane, dibromochloromethane, 1,1,2,2-tetrachloroethane, and dibenzo[a,h]anthracene.

3.2 DATA ASSESSMENT AND USABILITY CONCLUSIONS

The PARCCS criteria were evaluated, and with a few exceptions, all criteria were met. The data assessment concludes that all data generated during this event are usable for the intended purpose.

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TABLE 3.1 Quality Control Results for Groundwater Sampling (July 21 and 22, 2014) Red Hill Bulk Fuel Storage Facility July 2014 Quarterly Monitoring Report

		<u> </u>	July 2014 Quarterly Monitoring Report													ES Trip (7/21/2014) ES Trip (7/22/2014)											
		DOH EALS RHMW02 (ES104) RHMW02 (ES105) (DUP)												RPD ES Trip (7/21/2014) ES Trip (7/22/2014)													
Method	Chemical Constituent	Drinking Water Toxicity	Gross Contamination	Result	Q	LOQ	LOD	DL	Result	a	LOQ	LOD	DL	Duplicate (%)	Result	a	LOQ	LOD	DL	Result	o	LOG	LOD	DL			
EPA 8015B	TPH-d	190	100	1,200	HD	25	10	7.4	1,300	HD	25	10	7.4	8.00	-	-	-	-	-	-	-	-	-	-			
EPA 8260B	TPH-g	100	100	48	J	50	30	26	49	J	50	30	26	2.06	N.D.	U	50	30	26	N.D.	U	50	30	26			
	Acenaphthene	370	20	0.52		0.2	0.048	0.021	0.50		0.2	0.05	0.021	3.92	-	-	-	-	-	-	-	-	-	-			
	Acenaphthylene Anthracene	240 1,800	2,000 22	N.D. N.D.	U	0.2	0.048	0.018 0.035	N.D.	U	0.2	0.05	0.018	NA NA	-	 -	-	 	-	-	 -	-	 - 	-			
	Benzo[a]anthracene	0.092	4.7	N.D.	l ü	0.2	0.048	0.024	N.D.	l ü	0.2	0.05	0.024	NA NA	-	 -	-	-	-	-	+	-	-				
	Benzo[g,h,i]perylene	1,500	0.13	N.D.	U	0.2	0.048	0.022	N.D.	U	0.2	0.05	0.022	NA	-	<u> </u>	-	-	-	-	-	-	-	-			
	Benzo[a]pyrene	0.2	0.81	N.D.	U	0.2	0.048	0.037	N.D.	U	0.2	0.05	0.036	NA	-	-	-	-	-	-	-	-	-	-			
	Benzo[b]fluoranthene Benzo[k]fluoranthene	0.092 0.92	0.75 0.4	N.D. N.D.	U	0.2	0.048	0.025	N.D.	U	0.2	0.05	0.025	NA NA	-	 -	-	 	 -	-	 -	-					
	Chrysene	9.2	1	N.D.	1 0	0.2	0.048	0.024	N.D.	l ü	0.2	0.05	0.023	NA NA	-	 	-	 -	 	-	 -	-	-	-			
EPA 8270C	Dibenzo[a,h]anthracene	0.0092	0.52	N.D.	U	0.2	0.048	0.027	N.D.	U	0.2	0.05	0.027	NA	-	-	-	-	-	-	-	-	-	-			
	Fluoranthene	1,500	130	N.D.	U	0.2	0.048	0.028	N.D.	U	0.2	0.05	0.027	NA	-	-	-	-	-	-	-	_	-				
	Fluorene	240 0.092	950 0.095	0.24	 	0.2	0.048	0.025	0.23 N.D.	 u	0.2	0.05	0.024	4.26 NA	-	 -	-	<u> </u>	-	-	 -	-		-			
	Indeno[1,2,3-cd]pyrene 1-Methylnaphthalene	4.7	10	N.D. 25	J 0	0.2	0.046	0.022	26	1 -	0.2	0.05	0.022	3.92	-	 -	-	 	 	-	+	-	 				
	2-Methylnaphthalene	24	10	20		0.2	0.96	0.027	22		0.2	0.05	0.026	9.52	-	 -	-	 -	 -	-	 -	-	- 1	-			
	Naphthalene	17	21	71		2.0	0.96	0.23	76		2.0	0.5	0.23	6.80	-	-	-	-	-	-	-	-	-	-			
	Phenanthrene	240	410	N.D.	U	0.2	0.048	0.031	N.D.	U	0.2	0.05	0.030	NA NA	-	-	-	 -	-	-	 -	-	-	-			
	Pyrene 1,1,1,2-Tetrachloroethane	180 0.52	68 50,000	N.D. N.D.	U	0.2	0.048	0.025	N.D.	U	0.2	0.05	0.025	NA NA	N.D.	- U	- 1	0.5	0.4	N.D.	 -	1	0.5	0.4			
	1,1,2,2-Tetrachloroethane	0.067	500	N.D.	T U	1	0.5	0.41	N.D.	T U	1	0.5	0.41	NA NA	N.D.	U	1	0.5	0.41	N.D.	T Ü	1	0.5	0.41			
	1,1,1-Trichloroethane	200	970	N.D.	U	5	0.5	0.3	N.D.	U	5	0.5	0.3	NA	N.D.	U	5	0.5	0.3	N.D.	U	5	0.5	0.3			
	1,1,2-Trichloroethane	5	50,000	N.D.	U	1	0.5	0.38	N.D.	U	1	0.5	0.38	NA NA	N.D.	U	1	0.5	0.38	N.D.	U	1	0.5	0.38			
	1,1-Dichloroethane 1,1-Dichloroethylene	2.4	50,000 1,500	N.D.	U	5	0.5	0.28	N.D.	U	5	0.5	0.28	NA NA	N.D.	U	5	0.5	0.28	N.D.	U	5	0.5	0.28 0.43			
	1,2,3-Trichloropropane	0.6	50,000	N.D.	T U	5	1	0.43	N.D.	T Ü	5	1	0.43	NA NA	N.D.	1 0	5	1	0.43	N.D.	1 0	5	1	0.43			
	1,2,4-Trichlorobenzene	70	3,000	N.D.	U	5	1	0.5	N.D.	U	5	1	0.5	NA	N.D.	Ü	5	1	0.5	N.D.	Ū	5	1	0.5			
	1,2-Dibromo-3- chloropropane	0.04	10	N.D.	U	10	2	1.2	N.D.	U	10	2	1.2	NA	N.D.	U	10	2	1.2	N.D.	U	10	2	1.2			
	1,2-Dibromoethane	0.04	50,000	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	NA	N.D.	U	1	0.5	0.24	N.D.	U	1 1	0.5	0.24			
	1,2-Dichlorobenzene 1,2-Dichloroethane	600 0.15	7,000	N.D. N.D.	U	1 1	0.5	0.46	N.D.	U	1	0.5	0.46	NA NA	N.D.	U	1	0.5	0.46	N.D. N.D.	U	1	0.5 0.5	0.46 0.24			
	1,2-Dichloropropane	5	10	N.D.	Ü	5	0.5	0.42	N.D.	T U	5	0.5	0.42	NA NA	N.D.	U	5	0.5	0.42	N.D.	T Ü	5	0.5	0.42			
	1,3-Dichlorobenzene	180	5	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	NA	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4			
	1,3-Dichloropropene (total of cis/trans)	0.43	50,000	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25	NA	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25			
	1,4-Dichlorobenzene Acetone	75 22,000	5 20,000	N.D. N.D.	U,ICH	20	0.5	0.43	N.D.	U,IC	20	0.5 10	0.43	NA NA	N.D. 6.5	J	20	0.5	0.43	N.D.	U,IC	20	0.5 10	0.43			
	Benzene	5	170	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14	NA NA	N.D.	1 0	1	0.5	0.14	N.D.	1 0,10	1	0.5	0.14			
	Bromodichloromethane	0.12	50,000	N.D.	Ü	5	0.5	0.21	N.D.	U	5	0.5	0.21	NA	N.D.	Ü	5	0.5	0.21	N.D.	Ū	5	0.5	0.21			
	Bromoform	80	510	N.D.	U	10	1	0.5	N.D.	U	10	1	0.5	NA	N.D.	U	10	1	0.5	N.D.	U	10	1	0.5			
EPA 8260B	Bromomethane	8.7 5	50,000 520	N.D.	U	20	5	3.9	N.D.	U,ICJ	20	5	3.9 0.23	NA NA	N.D.	U	20	5	3.9	N.D.	U,ICJ	20	5	3.9			
EPA 6200B	Carbon Tetrachloride Chlorobenzene	100	50	N.D.	U	5	0.5	0.23	N.D.	U	5	0.5	0.23	NA NA	N.D.	U	5	0.5	0.23	N.D.	U	5	0.5 0.5	0.23			
	Chloroethane	21,000	16	N.D.	Ü	10	5	2.3	N.D.	Ū	10	5	2.3	NA	N.D.	Ü	10	5	2.3	N.D.	Ü	10	5	2.3			
	Chloroform	70	2,400	N.D.	U	5	0.5	0.46	N.D.	U	5	0.5	0.46	NA	N.D.	U	5	0.5	0.46	N.D.	U	5	0.5	0.46			
	Chloromethane	1.8	50,000	N.D.	U, IJ	10	2	1.8	N.D.	U	10	2	1.8	NA NA	N.D.	U	10	2	1.8	N.D.	U	10	2	1.8			
	cis-1,2-Dichloroethylene Dibromochloromethane	70 0.16	50,000 50,000	N.D. N.D.	U	1 1	0.5	0.48	N.D.	U	1	0.5	0.48	NA NA	N.D.	U	1 1	0.5	0.48	N.D.	U	1 1	0.5 0.5	0.48 0.25			
	Ethylbenzene	700	30	N.D.	j	1	0.5	0.14	N.D.	Ü	1	0.5	0.14	NA NA	N.D.	U	1	0.5	0.14	N.D.	l ü	1	0.5	0.14			
	Hexachlorobutadiene	0.86	6	N.D.	U	1	0.5	0.32	N.D.	U	1	0.5	0.32	NA	N.D.	U	1	0.5	0.32	N.D.	U	1	0.5	0.32			
	Methyl ethyl ketone (2-Butanone)	7,100	8,400	N.D.	U	10	5.0	2.2	N.D.	U	10	5.0	2.2	NA	N.D.	U	10	5.0	2.2	N.D.	U	10	5.0	2.2			
	Methyl isobutyl ketone (4-Methyl-2-Pentanone) Methyl tert-butyl Ether	2,000 12	1300 5	N.D. N.D.	U	10	5.0 0.5	0.31	N.D.	U	10 1	5.0 0.5	4.4 0.31	NA NA	N.D.	U	10 1	5.0 0.5	4.4 0.31	N.D.	U	10	5.0 0.5	4.4 0.31			
	Methylene chloride	4.8	9,100	N.D.	U	5	1.0	0.64	N.D.	1 υ	5	1.0	0.64	NA NA	N.D.	1 0	5	1.0	0.64	N.D.	1 0	5	1.0	0.64			
	Styrene	100	10	N.D.	U	1	0.5	0.17	N.D.	U	1	0.5	0.17	NA NA	N.D.	Ü	1	0.5	0.17	N.D.	Ü	1	0.5	0.17			
	1,1,1,2-Tetrachloroethane	0.52	50,000	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	NA	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4			
	1,1,2,2-Tetrachloroethane	0.067	500	N.D.	U	1 5	0.5	0.41	N.D.	U	1	0.5	0.41	NA NA	N.D.	U	1	0.5	0.41	N.D.	U	1 -	0.5	0.41			
	Tetrachloroethylene Toluene	5 1,000	170 40	N.D. N.D.	U	5	0.5	0.39	N.D.	U	5	0.5 0.5	0.39	NA NA	N.D.	U	5 1	0.5	0.39	N.D.	U	5	0.5 0.5	0.39			
	trans-1,2- Dichloroethylene	1,000	260	N.D.	1 0	1 1	0.5	0.24	N.D.	1 0	1	0.5	0.24	NA NA	N.D.	U	1	0.5	0.24	N.D.	1 0	1	0.5	0.24			
	Trichloroethylene	5	310	N.D.	Ü	1	0.5	0.37	N.D.	Ū	1	0.5	0.37	NA	N.D.	Ü	1	0.5	0.37	N.D.	Ü	1	0.5	0.37			
	Vinyl chloride	2	3,400	N.D.	U	1	0.5	0.3	N.D.	U	1	0.5	0.3	NA	N.D.	U	1	0.5	0.3	N.D.	U	1	0.5	0.3			
ED 4 0000	Xylenes	10,000	20	0.36	J	1	0.5	0.23	0.33	J	1	0.5	0.23	8.70	N.D.	U	11	1.5	0.23	N.D.	U	11	1.5	0.23			
EPA 6020	Lead	15	50,000	N.D.	U	1 1	0.2	0.0898	0.170	<u> </u>	11	0.2	0.0898	200			-							-			

The data are in micrograms per liter ($\mu g/L$). Shaded values exceeded the DOH EALs. - Not Analyzed

Not Analyzed

DOH Tier 1 Environmental Action Levels for groundwater where groundwater is a current drinking water source and surface water is greater than 150 meters from the site (DOH, Fall 2011).

Detection Limit or Method Detection Limit (MDL)

Environmental Protection Agency

The chromatographic pattern was inconsistent with the profile of the reference fuel standard.

Initial calibration verification recovery is above the control limit for this analyte.

Initial calibration verification recovery is below the control limit for this analyte.

Analyte was detected at a concentration below the LOQ and above the DL. Reported value is estimated.

DL EPA HD ICH ICJ J

Limit of Detection Limit of Quantitation LOD LOQ NA N.D.

Both results for duplicate pair were non-detect, no RPD calculations Not Detected

Not Detected
Qualifiers
Total Petroleum Hydrocarbons as gasoline
Total Petroleum Hydrocarbons as diesel
Undetected at DL and is reported as less than the LOD.

Contract No. N62742-12-D-1853

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SECTION 4 - SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

On July 21 and 22, 2014, ESI personnel collected groundwater samples from four monitoring wells at the RHSF (wells RHMW01, RHMW02, RHMW03, and RHMW05) and one sampling point at Red Hill Shaft (RHMW2254-01).

The groundwater sampling was conducted as part of the long-term groundwater and soil vapor monitoring at the RHSF, under NAVFAC Contract Number N62742-12-D-1853. The sampling was conducted in accordance with the approved WP/SAP prepared by ESI. A summary of the analytical results is provided below.

- RHMW01 TPH-d (67 μg/L) was the only analyte detected. The TPH-d concentration detected did not exceed the DOH EALs or the SSRBL.
- RHMW02 TPH-d (1,200 and 1,300 μg/L), TPH-g (48 and 49 μg/L), xylenes (0.36 and 0.33 μg/L), acenaphthene (0.52 and 0.50 μg/L), fluorene (0.24 and 0.23 μg/L), 1-methylnaphthalene (25 and 26 μg/L), 2-methylnaphthalene (20 and 22 μg/L), and naphthalene (71 and 76 μg/L) were detected. TPH-d, 1-methylnaphthalene, and naphthalene were detected at concentrations above their respective DOH EALs for both drinking water toxicity and gross contamination. However, the TPH-d concentrations did not exceed the SSRBL. 2-Methylnaphthalene was detected at concentrations above the DOH EAL for gross contamination.
- RHMW03 TPH-d (37 μg/L) was the only analyte detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs or the SSRBLs.
- RHMW05 None of the chemical constituents analyzed for were detected.
- RHMW2254-01 None of the chemical constituents analyzed for were detected.

Acetone (6.5 μ g/L) was detected in the trip blank submitted on July 21, 2014. Acetone was not detected in any of the groundwater samples, and this is not likely to affect data usability.

Groundwater Contaminant Trends

RHMW01 – COPCs detected during this round of quarterly sampling are consistent with the
historical data for RHMW01. TPH-d has historically been detected at concentrations above
the DOH EAL for both drinking water toxicity and gross contamination. TPH-d
concentrations have shown an overall decreasing trend from a high of 1,500 μg/L in
February 2005. The TPH-d concentration was last above the DOH EAL for gross
contamination in a sample collected on April 7, 2014.

- RHMW02 COPCs detected during this round of quarterly sampling are consistent with the historical data for RHMW02. TPH-g, TPH-d, trichloroethylene, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene have historically been detected at concentrations above the DOH EALs. TPH-d concentrations increased sharply from 2,400 µg/L to 5,100 µg/L during the additional sampling event on January 15, 2014, exceeding the SSRBL of 4,500 µg/L. During this July 2014 event, TPH-d concentrations decreased to an average of 1,250 µg/L but remained above both DOH EALs. The concentrations 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene increased to their highest levels since January 2013. The concentrations of TPH-q remained below the DOH EALs for gross contamination and drinking water toxicity. Trichloroethylene has not been detected in RHMW02 since September 2005.
- RHMW03 COPCs detected during this round of quarterly sampling are consistent with the
 historical data for RHMW03. TPH-d has historically been detected at concentrations above
 the DOH EALs; however, it has not been detected at concentrations above the DOH EALs
 since October 2010.
- RHMW05 No COPCs were detected during this round of quarterly sampling. TPH-d has
 historically been detected in RHMW05 at concentrations above the DOH EAL for both
 drinking water toxicity and gross contamination; however, it has not been detected at
 concentrations above the DOH EALs since January 2010.
- RHMW2254-01 No COPCs were detected during this round of quarterly sampling. TPH-d
 was last detected in RHMW2254-01 at a concentration above the DOH EAL for gross
 contamination in January 2008. Although the method reporting limits for TPH-d exceeded
 one or both DOH EALs between May 2009 and July 2010, TPH-d has not been detected at
 concentrations above the DOH EALs since January 2008.

Conclusions and Recommendations

Between January and July 2014, the sampling frequency of the wells and monitoring point inside Red Hill increased, due to response activities related to a reported release at Tank 5. Since the previous quarterly sampling event in April 2014, three wells (RHMW01, RHMW02, and RHMW05) and one sampling point (RHMW2254-01) have each been sampled three times, including this quarterly event. During this period only TPH-d in RHMW01 and TPH-d, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene in RHMW02 were detected at concentrations exceeding the DOH EALs. However, the TPH-d concentration detected in RHMW01 only exceeded the DOH EAL during the April 7, 2014 release response groundwater monitoring event. Groundwater contaminant concentrations in the other three wells (RHMW03, RHMW05, and RHMW2254-01) remained at low concentrations and did not change significantly, or were not detected.

Concentrations of 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene in RHMW02 show an increasing trend since March 5, 2014, but remain consistent with historical data. All other analytical results were generally consistent with historical data.

Based on the groundwater monitoring results and the reported release at Tank 5 in January 2014, continued groundwater monitoring at the wells inside the RHSF tunnel is recommended. The next quarterly event is tentatively scheduled for October 2014.

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SECTION 5 – FUTURE WORK

Future work includes the fourth quarter 2014 groundwater monitoring which is tentatively scheduled for October 2014. A quarterly groundwater monitoring report will be prepared to document the sampling event.

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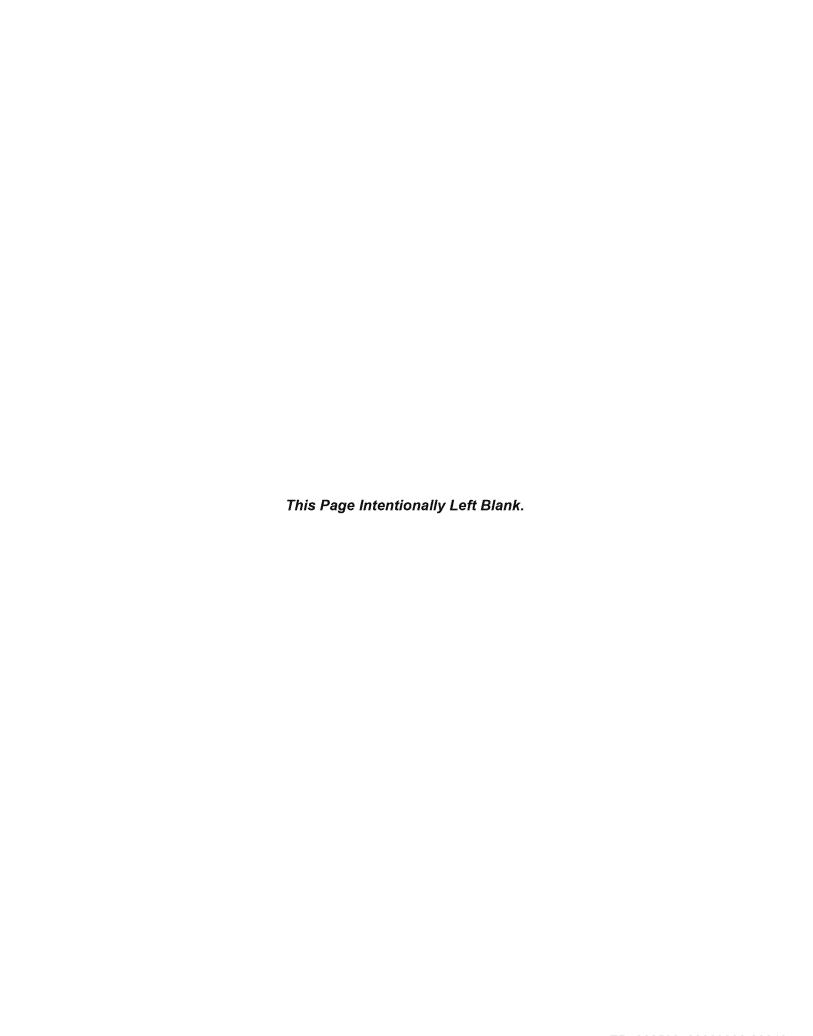
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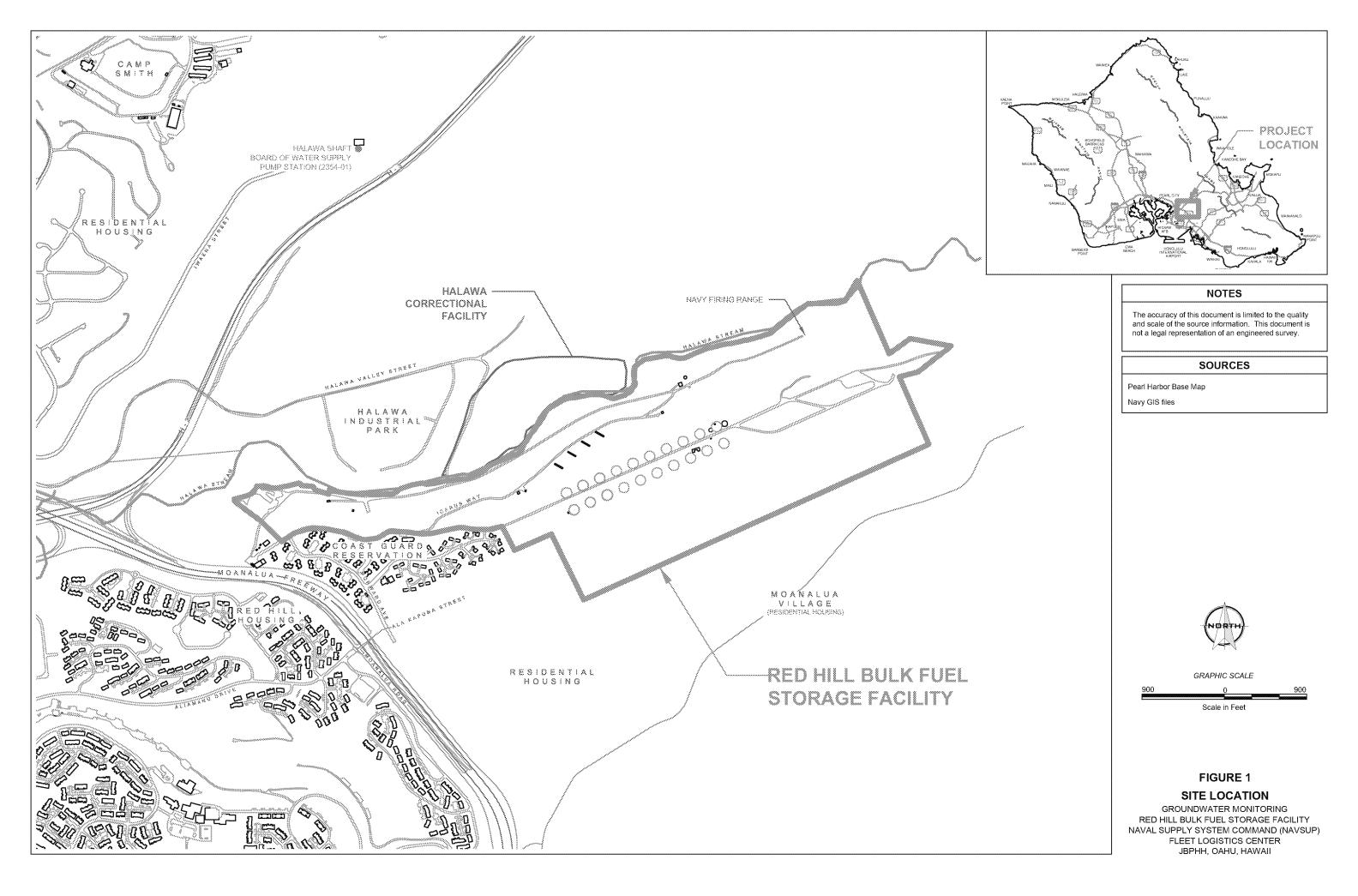
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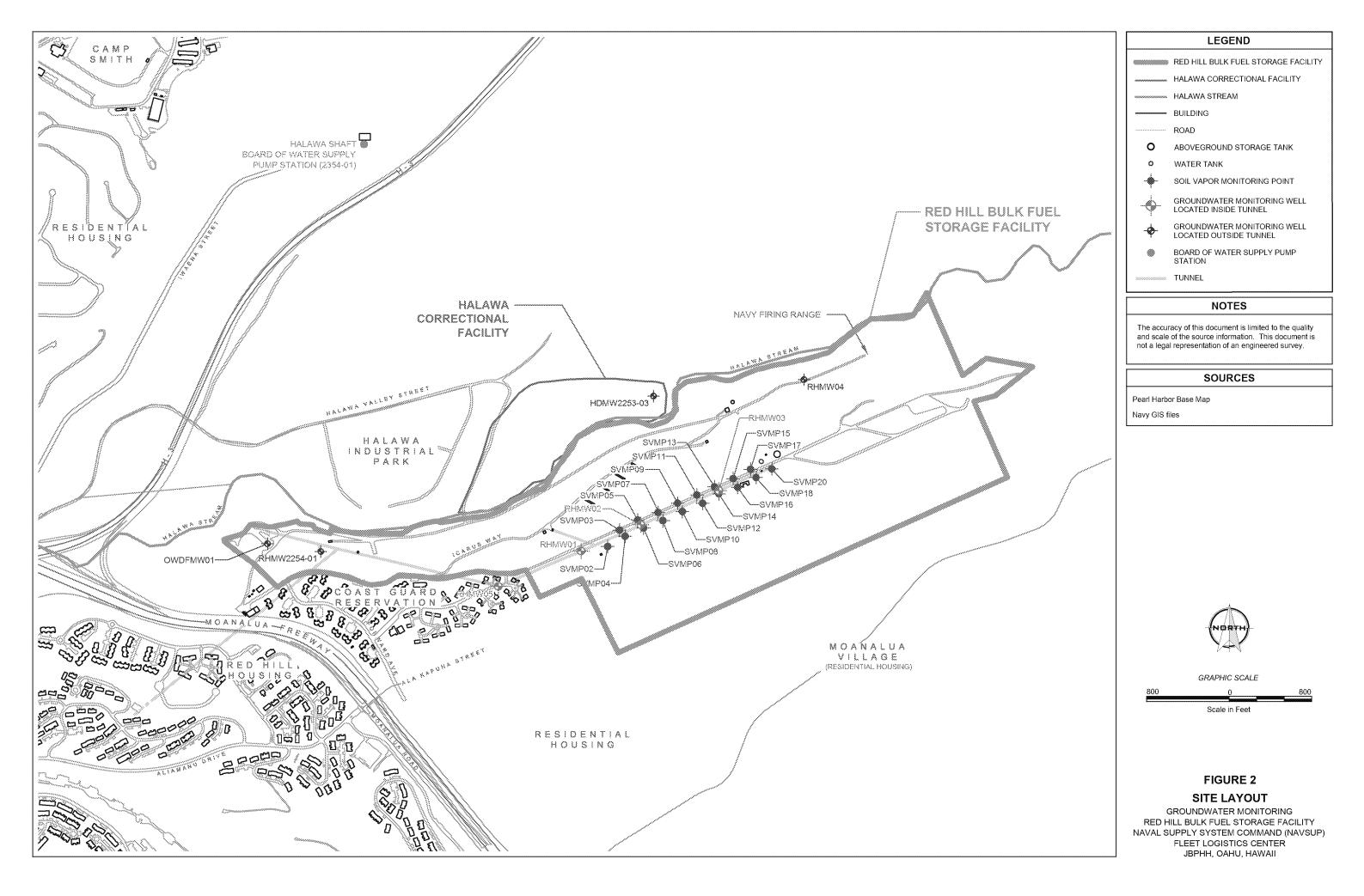
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FIGURES



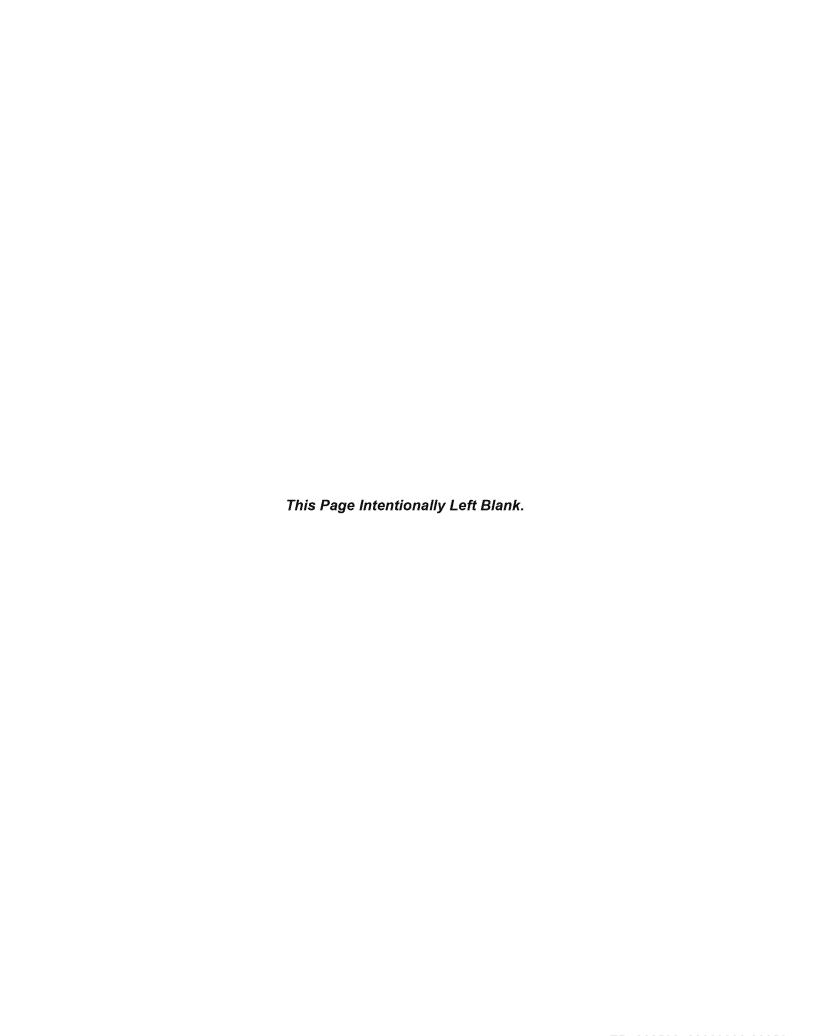








APPENDIX A Groundwater Sampling Logs





Well ID:	RHMW01	Location	n: Red Hill	Bulk Fuel Stora	age Facility	Project No.:	112066
Initial Wa	ater Level:	84.13 ft	Date:	7/21/2014		Time: 830)
Total De	pth of Well:	97.35 ft	Person	nel Involved:	Justin La	m, Jeff Hatteme	er
Length o	f Saturated Z	Cone: 13.22 ft	Weathe	er Conditions:	Not applicable	– well is located	d indoors
Volume o	of Water to b	e Removed: 2.5	L Method	of Removal:	Bla	dder Pump	
Water Le	evel After Pur	rging: 84.13 ft	Pumpir	ng Rate:	0.1	7 L/min	
Well Pur	ge Data:						
Time	Volum Remov		Conductivity (mS/cm)	DO (mg/l)	Temperature	Salinity	Redox (ORP) (mV)
837	0.0 L	7.77	0.343	7.60	25.6	-	95.1
840	0.5 L	7.20	0.35	7.12	25.33	-	 56.1
843	1.0 L	7.12	0.351	4.07	25.18		36.2
846	1.5 L	7.07	0.352	2.33	25.00	-	-6.7
849	2.0 L		0.352	2.3	25.05	-	- -7 .1
854	2.5 L	7.06	0.352	2.28	25.10	-	-7.3
•	Withdrawal M		Bladder Pur	mp			
			Clear				
	Turbidity Sedimei		Low				
	Other:	1l	None None				
		Parameters and Pre		lead - 6020	; TPH-g, VOCs - 8		
	• •	Sample Container	***************************************	ıl VOAs, 2 - 1L a	amber jar, 1 - 500	ml amber jar, 1	- 250ml HDPE
•	Identification		03 [0855]				
	mination Pro	***************************************				***************************************	
_		ave salinity parame					
Sampled	-	n Lam, Jeff Hattem				150	
	Delivered to	: <u>Calscience</u>	Environment		Transporters: Fee	dEx	~~~~
Date: _	7/21/2014		'anacity of Ca		Time: 1200		
		C	apacity of Ca	sing (Gallons/Li	near Feet)		

2"-0.16 • 4"-0.65 • 8"-2.61 • 10"-4.08 • 12"-5.87



Well ID:	:_RHMW02		Location	Red Hil	l Bulk Fuel Stora	ige Facility	Project No.:	112066	
Initial W	/ater Level: _	86.88	0 ft	Date:	7/21/2014		Time: 93	<u>6</u>	
Total De	epth of Well:		92.91 ft	Person	nel Involved:	Justin L	am, Jeff Hattem	er	
Length •	of Saturated 2	Zone:	6.11 ft	Weathe	er Conditions:	Not applicable – well is located indoors			
Volume	of Water to b	e Rem	oved: 2.0 L	Method	l of Removal:	Bladder Pump			
Water L	.evel After Pu	rging:	86.80 ft	Pumpir	ng Rate:	0.	.17 L/min		
Well Pu	irge Data:								
Time	Volun Remov		pН	Conductivity (mS/cm)	DO (mg/l)	Temperature	e Salinity	Redox (ORP) (mV)	
944	0.0 L		7.09	0.581	0.50	24.12	-	-163.9	
947	0.5 L			0.582	0.48	24.04	~		
950	1.0 L		7.05	0.585	0.41	24.00	***	 -151.8	
953	1.5 L		7.04	0.590	0.40	23.95		 -150.6	
953	2.0 L		7.04	0.590	0.40	23.96		-149.7	
**********************		100000000000 1000		***************************************	***************************************	***************************************	***************************************	MARIN MARINDANIANIANIANIANIANIANIANIANIANIANIANIANIA	
	***************************************				***************************************				
Sample		 Viethod:		Bladder Pur					
•	ance of Samp								
	Color:			Clear					
	Turbidit	.y:		Low					
	Sedime	nt:		None					
	Other:			None					
Laborat	ory Analysis I	Darama	tors and Proc	convetives:	TDU 4 9015:	TDH a VOCa	· 8260; PAHs - 82	2700 sim:	
Laborat	Ory Arialysis i	-aranne	iters and Fres	servatives.	lead - 6020	TFH-y, VOCs -	0200, FARS - 02	27 OC SIIII,	
Numbei	r and Types o	f Samo	le Containers	: 16 - 40ml		ber jar. 4 - 500r	ml amber jar, 4 -	500ml HDPE	
	Identification	-			04 MS/MSD [10				
•	amination Pro				7 1110/11105	, <u>, , , , , , , , , , , , , , , , , , </u>	<u> </u>		
	YSI did not h								
Sample			Jeff Hatteme						
	d Delivered to			Environmenta	al Lab	Transporters: Fe	edEx		
Date:	7/21/2014	***************************************				Time: 1200		***************************************	
	***************************************		С	apacity of Cas	sing (Gallons/Lin	ear Feet)			

2"-0.16 • 4"-0.65 • 8"-2.61 • 10"-4.08 • 12"-5.87



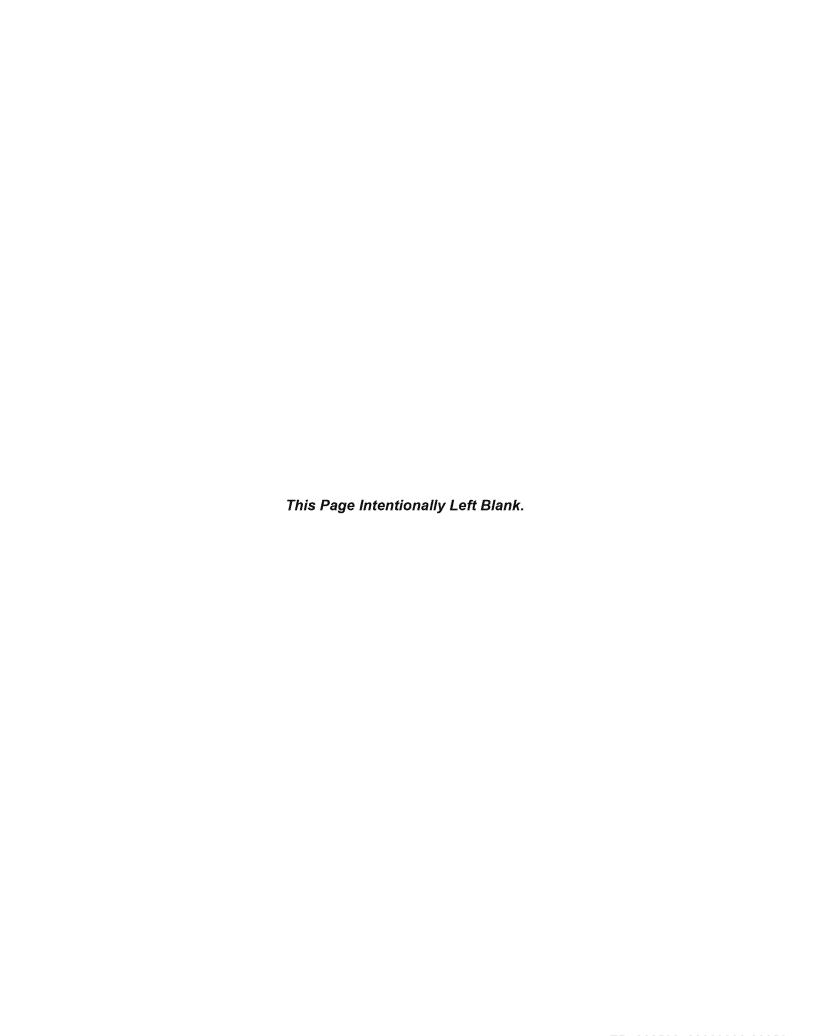
Well ID:	RHMW03	-	Location:	Red Hi	ll Bulk Fuel Stor	age Facility	Project No.:	112066	
Initial Wa	ater Level:	102.98 ft		Date:	7/22/2014		Time: 1	100	
Total De	pth of Well:	110	12 ft	Persor	nnel Involved:	Justin	Lam, Jeff Hatte	mer	
Length o	of Saturated Z	one:	7.14 ft	Weath	er Conditions:	Not applicab	ole – well is loca	ted indoors	
Volume	of Water to b	e Remove	d: <u>4.0 L</u>	Method	d of Removal:	Е	Bladder Pump		
Water Lo	evel After Pur	ging:	102.98 ft	Pumping Rate:		0.33 L/min			
Well Pur	ge Data:								
	Volum			onductivity				Redox (ORP)	
Time	Remov	<u>ed</u> p	<u>H</u>	(mS/cm)	DO (mg/l)	Temperatur	<u> </u>	(mV)	
1105	0.0 L	6.	<u>71</u>	0.743	2.40	26.90		123.5	
1108	1.0 L	6.	72	0.742	2.25	26.87		110.5	
1111	2.0 L	6.	76	0.746	1.64	26.61	_	84.0	
1114	3.0 L	 6.	76	0.746	1.60	26.64	_		
1117	4.0 L	6.	78	0.746	1.61	26.60		76.0	
000000000000000000000000000000000000000	***************************************	***************************************	nannanananananan sanananan		***************************************			***************************************	
	MARKAN MA								
						-			
Sample	Withdrawal M	lethod:		Bladder Pu	ımp	-			
Appeara	ince of Sampl	e:							
	Color:			Clear		_			
	Turbidity	<i>'</i> :		Low		_			
	Sedimer	nt:		None					
	Other:	***************************************		None		•			
Laborato	ory Analysis P	arameters	and Prese	ervatives:	TPH-d - 8015	; TPH-g, VOCs	- 8260; PAHs -	8270c sim;	
					lead - 6020				
Number	and Types of	Sample C	ontainers:	6 - 40n	nl VOAs, 2 - 1L	amber jar, 1 - 5	00ml amber jar,	1 - 250ml HDPE	
Sample	Identification	Numbers:	ES106	***************************************					
	mination Prod		Triple Rins						
	YSI did not h								
Sampled			Hattemer						
	Delivered to			nvironment	tal Lab	Transporters: F	edEx		
	7/22/2014				-	Time: 1215			
				-	asing (Gallons/Li 8"-2.61 • 10"-4	•		-	



Well ID:	RHMW05	-	Location:	Red Hi	II Bulk Fuel Stora	age Facility	Project No.:	112066	
Initial Wa	ater Level:	83.49 ft	<u> </u>	Date:	7/22/2014		Time: 1	013	
Total De	pth of Well:	Unable	to Measure	_ Persor	nnel Involved:	Justin I	Lam, Jeff Hatte	mer	
Length c	of Saturated Z	one:	Unknown	_ Weath	er Conditions:	Not applicab	le – well is loca	ted indoors	
Volume	of Water to b	e Remove	ed: <u>4.0 L</u>	_ Method	d of Removal:	Е	Bladder Pump		
Water Le	evel After Pur	ging:	83.49 ft	Pumping Rate:		0.33 L/min			
Well Pur	ge Data:								
	Volum			onductivity				Redox (ORP)	
Time	Remov	<u>ed</u>	<u>pH</u>	(mS/cm)	DO (mg/l)	Temperatur	<u> </u>		
1018	0.0 L		7.73	0.837	9.60	23.67	_	98.9	
1021	1.0 L		7.64	0.839	8.42	23.40	-	90.7	
1024	2.0 L	7	7.58	0.836	7.98	22.79		68.9	
1027	3.0 L	. 7	7.54	0.836	7.80	22.68	_	67.1	
1030	4.0 L		7.53	0.830	7.80	22.66		66.8	
		annonnon annonnon	contraction and the second		***************************************	***************************************			
Sample '	Withdrawal M	lethod: _		Bladder Pu	ımp				
Appeara	nce of Samp	e:							
	Color:			Clear					
	Turbidity	<i>/</i> :		Clear		_			
	Sedime	nt:		None					
	Other:			None		•			
Laborato	ory Analysis F	arameter	s and Prese	ervatives:	TPH-d - 8015	; TPH-g, VOCs	- 8260; PAHs -	8270c sim;	
					lead - 6020				
Number	and Types of	Sample	Containers:	6 - 40n	nl VOAs, 2 - 1L a	amber jar, 1 - 50	00ml amber jar,	1 - 250ml HDPE	
Sample	Identification	Numbers	: ES108	[1035]					
Deconta	mination Pro	cedures:	Triple Rin	sed					
	YSI did not h								
Sampled			ff Hattemer						
	Delivered to	:C	alscience E	nvironmen	tal Lab	Transporters: F	FedEx		
Date:	7/22/2014				-	Time: 1215			
				-	asing (Gallons/Li • 8"-2.61 • 10"-4.	•			

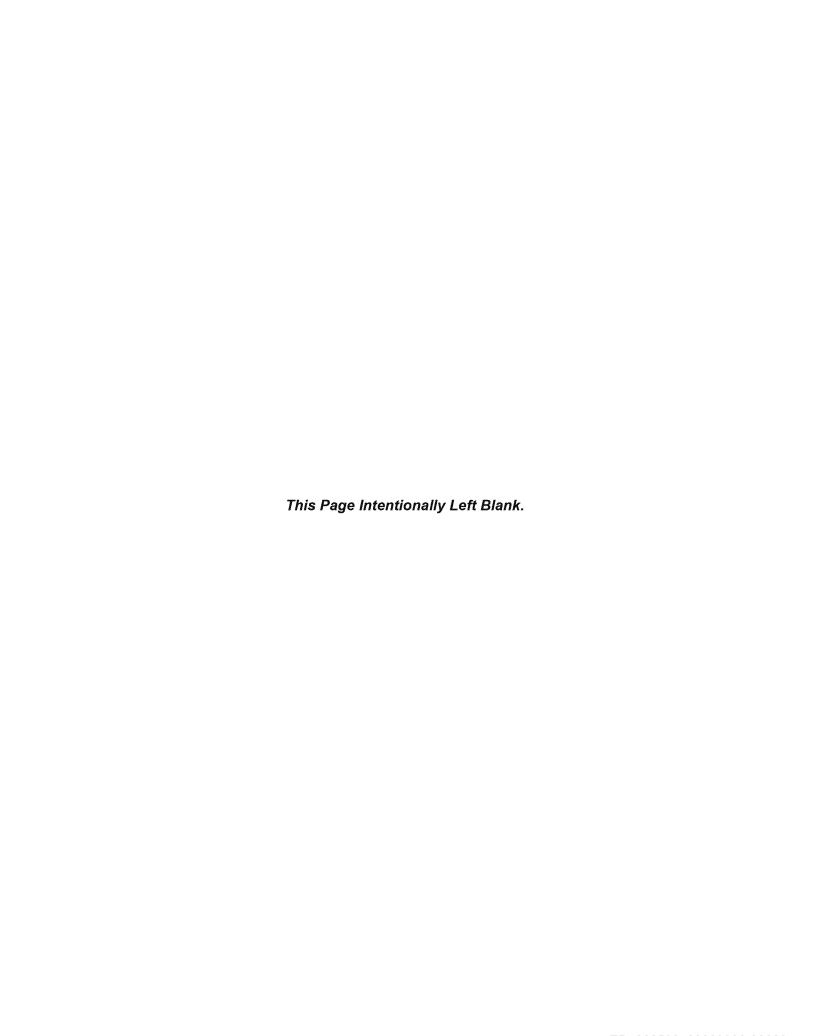


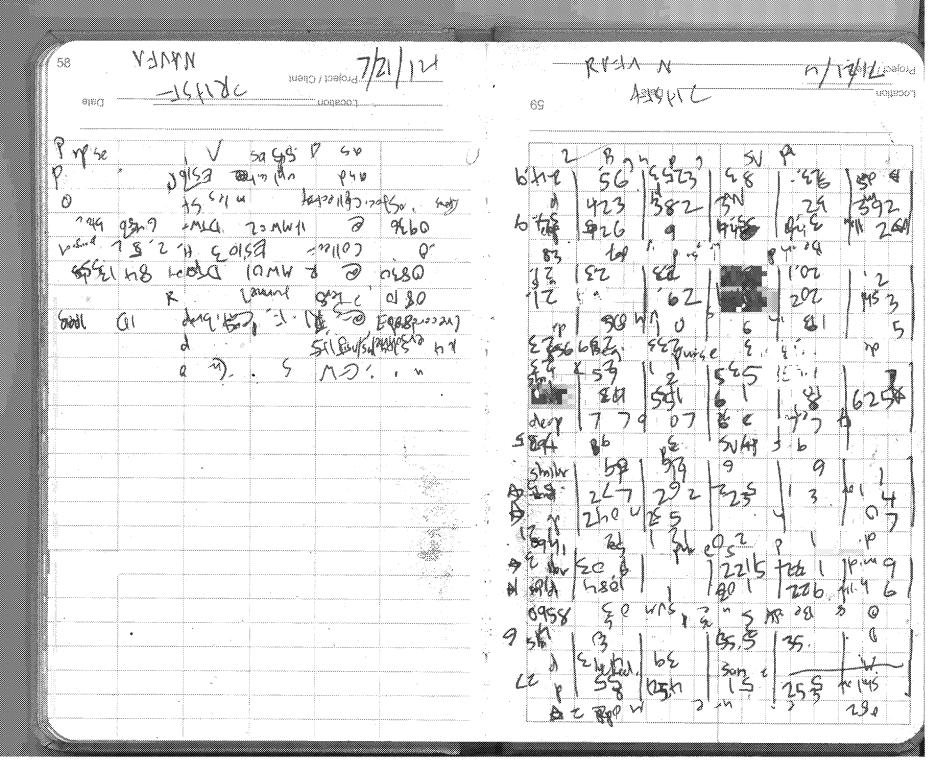
Well ID: R	HMW2254	<u>-01</u>	Location	on: Red	Hill Bulk Fuel Stor	age Facility	Project No.:	112066		
Initial Wate	er Level:	82.1	9 ft	Date: _	7/22/2014		Time: 91	5		
Total Dept	h of Well:	No	ot applicable	e Pers	sonnel Involved: _	Justin L	.am, Jeff Hattem	er		
Length of S	Saturated 2	one: _	Not applica	ble Wea	ather Conditions:	Not applicabl	e – well is locate	d indoors		
Volume of	Water to b	e Rem	oved: <u>4.0</u>	L Met	hod of Removal: _	В	ladder Pump			
Water Leve	el After Pu	rging:	82.19	ft Pun	nping Rate:	0	0.33 L/min			
Well Purge	e Data:									
	Volum			Conductiv	•			Redox (ORP)		
Time	Remov		рН	(mS/cm)		Temperature	Salinity	(mV)		
920	0.0 L	•	7.60	0.504	7.92	23.03		45.4		
923	1.0 L		7.34	0.525	7.55	22.52		29.1		
926	2.0 L		7.30	0.527	7.53	22.44		27.9		
929	3.0 L		7.32	0.527	7.52	22.41	-	27.7		
932	4.0 L		7.31	0.527	7.52	22.41		27.6		
Sample W	ithdrawal N	/lethod		Bladder	Pump	_				
Appearance	e of Samp	le:								
	Color:			Clear						
	Turbidit	y:		Clear		-				
	Sedime	nt:		None		-				
	Other:			None		<u>.</u>				
Laboratory	Analysis F	Parame	eters and P	reservatives	s: TPH-d - 8015	s; TPH-g, VOCs -	- 8260; PAHs - 82	270c sim;		
					lead - 200.8					
Number ar	nd Types o	f Samp	ole Containe	ers: 6-4	40ml VOAs, 2 - 1L	amber jar, 1 - 50	0ml amber jar, 1	- 250ml HDPE		
Sample Ide	entification	Numb	ers: ES	107, ES107	***************************************					
Decontami										
			llinity paran							
Sampled b			Jeff Hatter			***************************************				
Sampled D	·	·		e Environm	ental Lab	Transporters: F	edEx			
	22/2014					Time: 1215				
~					Casing (Gallons/L 55 • 8"-2.61 • 10"-4	•				

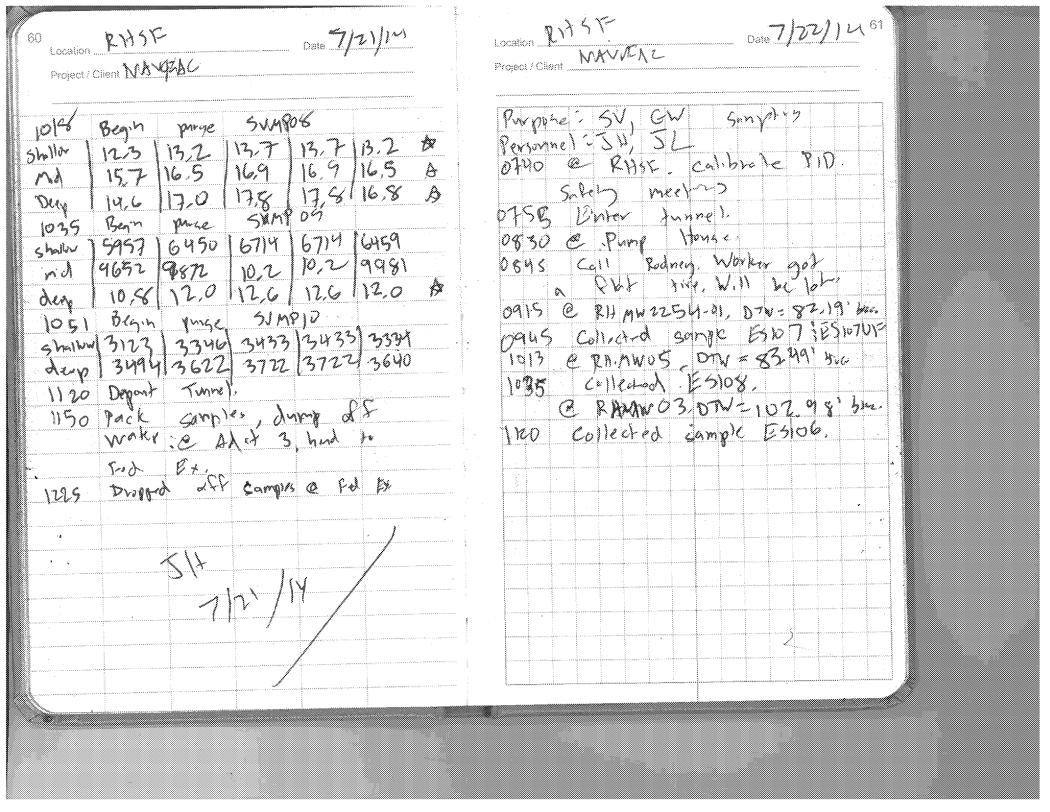


APPENDIX B

Field Notes

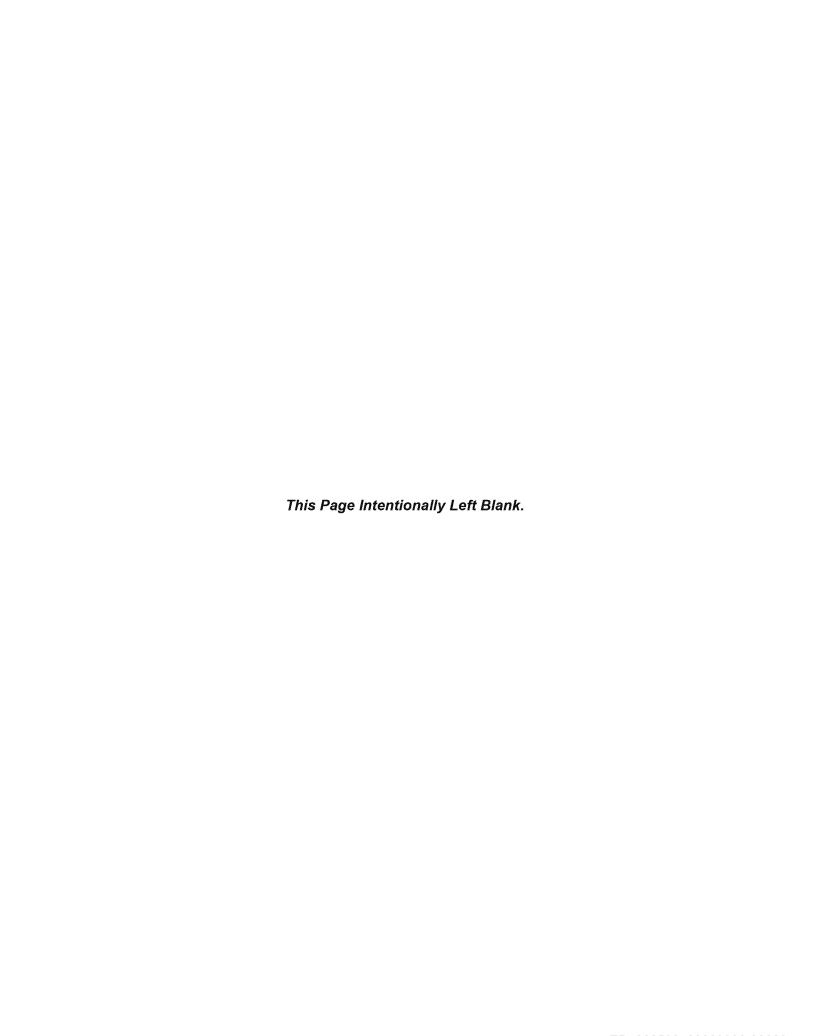








APPENDIX C Laboratory Reports





Calscience



WORK ORDER NUMBER: 14-07-1466

The difference is service



AIR SOL WATER MARINE CHEMISTRY

Analytical Report For

Client: Environmental Science International, Inc.

Client Project Name: Red Hill LTM 112066

Attention: Domonkos Feher, Ph.D.

354 Uluniu Street, Suite 304 Kailua, HI 96734-2500

Rand Ollo

Approved for release on 07/30/2014 by: Richard Villafania Project Manager



Resultant

Emailyour PM &

Eurofins Calscience, Inc. (Calscience) certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

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Work Order Number:	14-07-1466

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Work Order Narrative

Work Order: 14-07-1466 Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 07/22/14. They were assigned to Work Order 14-07-1466.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

New York NELAP air certification does not certify for all reported methods and analytes, reference the accredited items here: http://www.calscience.com/PDF/New_York.pdf

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.



Analytical Report

 Environmental Science International, Inc.
 Date Received:
 07/22/14

 354 Uluniu Street, Suite 304
 Work Order:
 14-07-1466

 Kailua, HI 96734-2500
 Preparation:
 EPA 3510C

 Method:
 EPA 8015B (M)

 Units:
 ug/L

Project: Red Hill LTM 112066 Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES103	14-07-1466-1-1	07/21/14 08:55	Aqueous	GC 45	07/23/14	07/24/14 21:13	140723B11A
Comment(s): - Results were evaluated to	the MDL (DL), conc	entrations >= to th	he MDL (DL)) but < RL (LO	Q), if found, a	re qualified with a	a "J" flag.
<u>Parameter</u>	<u>Result</u>	<u>DL</u>	LOD	<u>LO</u>	Q	<u>DF</u>	<u>Qualifiers</u>
TPH as Diesel	67	11	12	25		1.00	HD
Surrogate n-Octacosane	<u>Rec. (%)</u> 127	<u>Control Limi</u> 51-141	<u>its</u> Qualifi	<u>ers</u>			

ES104	14-0		07/21/14 Ac 10:00	ueous GC 45	07/23/14	07/24/14 21:30	140723B11A
Comment(s):	- Results were evaluated to the M	IDL (DL), conce	ntrations >= to the	MDL (DL) but < RL	. (LOQ), if found, a	are qualified with a	a "J" flag.
<u>Parameter</u>		Result	<u>DL</u>	<u>LOD</u>	LOQ	<u>DF</u>	Qualifiers
TPH as Diesel		1200	11	12	25	1.00	HD
Surrogate n-Octacosane		<u>Rec. (%)</u> 110	Control Limits 51-141	Qualifiers			

ES105	14-4		07/21/14 Ac 10:55	queous GC 45	07/23/14	07/24/14 21:48	140723B11A
Comment(s):	- Results were evaluated to the	MDL (DL), conce	ntrations >= to the	MDL (DL) but < R	L (LOQ), if found,	are qualified with	a "J" flag.
<u>Parameter</u>		Result	<u>DL</u>	LOD	<u>LOQ</u>	<u>DF</u>	Qualifiers
TPH as Diesel		1300	11	12	25	1.00	HD
Surrogate		Rec. (%)	Control Limits	Qualifiers			
n-Octacosane		135	51-141				

Method Blank	099-	15-516-158 N/	Aqu Aqu	ueous GC 45	07/23/14	07/24/14 18:11	140723B11A
Comment(s):	- Results were evaluated to the M	IDL (DL), concenti	rations >= to the N	MDL (DL) but < RL	(LOQ), if found,	are qualified with	a "J" flag.
<u>Parameter</u>		<u>Result</u>	<u>DL</u>	LOD	LOQ	<u>DF</u>	Qualifiers
TPH as Diesel		<12	11	12	25	1.00	U
<u>Surrogate</u>		<u>Rec. (%)</u>	Control Limits	<u>Qualifiers</u>			
n-Octacosane		101	51-141				



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Analytical Report

Environmental Science International, Inc.

Date Received:

Work Order:

14-07-1466

Kailua, HI 96734-2500

Preparation:

Method:

Units:

Project: Red Hill LTM 112066

Client Sample Number

Date/Time Matrix Instrument Date Prepared Analyzard

Analyzard

O7/22/14

Work Order:

14-07-1466

EPA 3005A Filt.

Method:

Units:

Date/Time Prepared Analyzard

Analyzard

OR Batch ID

Client Sample N	lumber	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES103		14-07-1466-1-J	07/21/14 08:55	Aqueous	ICP/MS 04	07/23/14	07/24/14 19:50	140723L03D
Comment(s):	- Results were evaluated t	o the MDL (DL), conc	entrations >= to f	the MDL (DL)) but < RL (LO	Q), if found, a	re qualified with a	a "J" flag.
<u>Parameter</u>		<u>Result</u>	<u>DL</u>	<u>LOD</u>	LO	<u>Q</u>	<u>DF</u>	<u>Qualifiers</u>
Lead		<0.000200	0.0000898	0.0002	200 0.0	00100	1.00	U
ES104		14-07-1466-2-J	07/21/14 10:00	Aqueous	ICP/MS 04	07/23/14	07/24/14 19:48	140723L03D
Comment(s):	- Results were evaluated t	o the MDL (DL), conc	entrations >= to	the MDL (DL)) but < RL (LO	Q), if found, a	re qualified with a	a "J" flag.
Comment(s): Parameter	- Results were evaluated t	to the MDL (DL), conc Result	entrations >= to t	the MDL (DL) <u>LOD</u>) but < RL (LO <u>LO</u>	• • • • • • • • • • • • • • • • • • • •	are qualified with a	a "J" flag. <u>Qualifiers</u>
` '	- Results were evaluated t	` '		` '	<u>LO</u>	• • • • • • • • • • • • • • • • • • • •	•	•

20.00	17.0	10		icous ioi illio	07/20/14	19:52	1401202000
Comment(s):	- Results were evaluated to the M	IDL (DL), concent	rations >= to the N	IDL (DL) but < RL	(LOQ), if found, a	are qualified with a	ı "J" flag.
<u>Parameter</u>		Result	<u>DL</u>	LOD	LOQ	<u>DF</u>	Qualifiers
Lead		0.000170	0.0000898	0.000200	0.00100	1.00	J

Method Blank	USS	-14-43/-6/ N	IIA AL	ueous ICP/Wis	104 07/23/14	19:24	140723103
Comment(s):	- Results were evaluated to the I	MDL (DL), concen	trations >= to the	MDL (DL) but < F	RL (LOQ), if found	, are qualified \	with a "J" flag.
<u>Parameter</u>		Result	<u>DL</u>	LOD	LOQ	<u>DF</u>	<u>Qualifiers</u>
Lead		<0.000200	0.0000898	0.000200	0.00100	1.00	U



Analytical Report

Environmental Science International, Inc.

354 Uluniu Street, Suite 304

Kailua, HI 96734-2500

Date Received:

07/22/14 14-07-1466

Work Order: Preparation:

EPA 3510C

Method:

EPA 8270C SIM PAHs

Units:

ug/L

Project: Red Hill LTM 112066

Page 1 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES103	14-07-1466-1-G	07/21/14 08:55	Aqueous	GC/MS AAA	07/28/14	07/29/14 16:17	140728L01
Comment(s): - Results were evaluated	to the MDL (DL), con	centrations >= to t	he MDL (DL	.) but < RL (LOC	Q), if found, a	re qualified with a	a "J" flag.
<u>Parameter</u>	Result	<u>DL</u>	LOD	LOC	3	<u>DF</u>	Qualifiers
Naphthalene	<0.051	0.024	0.051	0.20)	1.00	U
2-Methylnaphthalene	<0.051	0.027	0.051	0.20)	1.00	U
1-Methylnaphthalene	<0.051	0.029	0.051	0.20)	1.00	U
Acenaphthylene	<0.051	0.018	0.051	0.20)	1.00	U
Acenaphthene	<0.051	0.021	0.051	0.20)	1.00	U
Fluorene	<0.051	0.025	0.051	0.20)	1.00	U
Phenanthrene	<0.051	0.031	0.051	0.20)	1.00	U
Anthracene	<0.051	0.035	0.051	0.20)	1.00	U
Fluoranthene	<0.051	0.028	0.051	0.20)	1.00	U
Pyrene	<0.051	0.025	0.051	0.20)	1.00	U
Benzo (a) Anthracene	<0.051	0.024	0.051	0.20)	1.00	U
Chrysene	<0.051	0.019	0.051	0.20)	1.00	U
Benzo (k) Fluoranthene	<0.051	0.024	0.051	0.20)	1.00	U
Benzo (b) Fluoranthene	<0.051	0.025	0.051	0.20)	1.00	U
Benzo (a) Pyrene	<0.051	0.037	0.051	0.20)	1.00	U
Indeno (1,2,3-c,d) Pyrene	<0.051	0.022	0.051	0.20)	1.00	U
Dibenz (a,h) Anthracene	<0.051	0.027	0.051	0.20)	1.00	U
Benzo (g,h,i) Perylene	<0.051	0.022	0.051	0.20)	1.00	U
Surrogate	Rec. (%)	Control Limi	its Qualif	iers			
Nitrobenzene-d5	75	28-139	no Qualii	1010			
2-Fluorobiphenyl	76	33-144					
p-Terphenyl-d14	73	23-160					
p respicity: a st	, 0	20-100					

07/22/14

14-07-1466

EPA 3510C

EPA 8270C SIM PAHs



p-Terphenyl-d14

Analytical Report

Environmental Science International, Inc.

Date Received:

Work Order:

Kailua, HI 96734-2500 Preparation:

Units: ug/L

Method:

Project: Red Hill LTM 112066 Page 2 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES104	14-07-1466-2-G	07/21/14 10:00	Aqueous	GC/MS AAA	07/28/14	07/29/14 16:41	140728L01
Comment(s): - Results were evaluated t	o the MDL (DL), con	centrations >= to t	he MDL (DL) but < RL (LOC	Q), if found, a	are qualified with a	a "J" flag.
<u>Parameter</u>	Result	<u>DL</u>	LOD	LOC	3	<u>DF</u>	Qualifiers
Acenaphthylene	<0.048	0.017	0.048	0.19)	1.00	U
Acenaphthene	0.52	0.020	0.048	0.19)	1.00	
Fluorene	0.24	0.023	0.048	0.19)	1.00	
Phenanthrene	<0.048	0.029	0.048	0.19)	1.00	U
Anthracene	<0.048	0.033	0.048	0.19)	1.00	U
Fluoranthene	<0.048	0.026	0.048	0.19)	1.00	U
Pyrene	<0.048	0.024	0.048	0.19)	1.00	U
Benzo (a) Anthracene	<0.048	0.023	0.048	0.19)	1.00	U
Chrysene	<0.048	0.018	0.048	0.19)	1.00	U
Benzo (k) Fluoranthene	<0.048	0.022	0.048	0.19)	1.00	U
Benzo (b) Fluoranthene	<0.048	0.024	0.048	0.19)	1.00	U
Benzo (a) Pyrene	<0.048	0.035	0.048	0.19)	1.00	U
Indeno (1,2,3-c,d) Pyrene	<0.048	0.021	0.048	0.19)	1.00	U
Dibenz (a,h) Anthracene	<0.048	0.026	0.048	0.19)	1.00	U
Benzo (g,h,i) Perylene	<0.048	0.021	0.048	0.19)	1.00	U
Surrogate	Rec. (%)	Control Limi	its Qualifi	are			
Nitrobenzene-d5	82	28-139	ito Qualili	<u> </u>			
2-Fluorobiphenyl	79	33-144					

ES104	14-07-1466-2-G	07/21/14 Aq 10:00	ueous GC/N	IS AAA 07/28/14	07/29/14 21:31	140728L01
Comment(s): - Results were evaluated t	o the MDL (DL), conce	entrations >= to the	MDL (DL) but <	RL (LOQ), if found	are qualified with	a "J" flag.
<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	LOQ	<u>DF</u>	<u>Qualifiers</u>
Naphthalene	71	0.44	0.96	3.8	20.0	
2-Methylnaphthalene	20	0.51	0.96	3.8	20.0	
1-Methylnaphthalene	25	0.54	0.96	3.8	20.0	
Surrogate	Rec. (%)	Control Limits	Qualifiers			
Nitrobenzene-d5	65	28-139				
2-Fluorobiphenyl	77	33-144				
p-Terphenyl-d14	52	23-160				

23-160

79



Environmental Science International, Inc.

354 Uluniu Street, Suite 304

Kailua, HI 96734-2500

Date Received:

07/22/14 14-07-1466

Work Order: Preparation:

EPA 3510C

Method:

EPA 8270C SIM PAHs

Units:

ug/L

Project: Red Hill LTM 112066

Page 3 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES105	14-07-1466-3-G	07/21/14 10:55	Aqueous	GC/MS AAA	07/28/14	07/29/14 17:05	140728L01
Comment(s): - Results were evaluated	to the MDL (DL), con	centrations >= to t	the MDL (DL	.) but < RL (LOC	Q), if found, a	are qualified with	a "J" flag.
<u>Parameter</u>	Result	<u>DL</u>	LOD	LOC	3	DF	Qualifiers
Acenaphthylene	<0.051	0.018	0.051	0.20)	1.00	U
Acenaphthene	0.50	0.021	0.051	0.20)	1.00	
Fluorene	0.23	0.025	0.051	0.20)	1.00	
Phenanthrene	<0.051	0.031	0.051	0.20)	1.00	U
Anthracene	<0.051	0.035	0.051	0.20)	1.00	U
Fluoranthene	<0.051	0.028	0.051	0.20)	1.00	U
Pyrene	<0.051	0.025	0.051	0.20)	1.00	U
Benzo (a) Anthracene	<0.051	0.024	0.051	0.20)	1.00	U
Chrysene	<0.051	0.019	0.051	0.20)	1.00	U
Benzo (k) Fluoranthene	<0.051	0.024	0.051	0.20)	1.00	U
Benzo (b) Fluoranthene	<0.051	0.025	0.051	0.20)	1.00	U
Benzo (a) Pyrene	<0.051	0.037	0.051	0.20)	1.00	U
Indeno (1,2,3-c,d) Pyrene	<0.051	0.022	0.051	0.20)	1.00	U
Dibenz (a,h) Anthracene	<0.051	0.027	0.051	0.20)	1.00	U
Benzo (g,h,i) Perylene	<0.051	0.022	0.051	0.20)	1.00	U
Surrogate	<u>Rec. (%)</u>	Control Lim	<u>its Qualif</u>	<u>iers</u>			
Nitrobenzene-d5	85	28-139					
2-Fluorobiphenyl	80	33-144					
p-Terphenyl-d14	79	23-160					

ES105	14-07-1466-3-G	07/21/14 Aq 10:55	ueous GC/N	IS AAA 07/28/14	07/29/14 21:55	140728L01
Comment(s): - Results were evaluated	to the MDL (DL), conce	entrations >= to the	MDL (DL) but <	RL (LOQ), if found	, are qualified with	a "J" flag.
<u>Parameter</u>	<u>Result</u>	<u>DL</u>	LOD	LOQ	<u>DF</u>	<u>Qualifiers</u>
Naphthalene	76	0.47	1.0	4.1	20.0	
2-Methylnaphthalene	22	0.54	1.0	4.1	20.0	
1-Methylnaphthalene	26	0.57	1.0	4.1	20.0	
Surrogate	Rec. (%)	Control Limits	Qualifiers			
Nitrobenzene-d5	57	28-139				
2-Fluorobiphenyl	65	33-144				
p-Terphenyl-d14	47	23-160				



Environmental Science International, Inc.

354 Uluniu Street, Suite 304

Kailua, HI 96734-2500

Benzo (g,h,i) Perylene

Date Received:

Work Order: 14-07-1466

Preparation:

EPA 8270C SIM PAHs

Method: Units:

LI 7 02700 01101 7 113

07/22/14

EPA 3510C

ug/L Page 4 of 4

Project: Red	d Hill LT	M 112066
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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-15-148-52	N/A	Aqueous	GC/MS AAA	07/28/14	07/29/14 13:03	140728L01
Comment(s): - Results were evaluated	to the MDL (DL), con	centrations >= t	o the MDL (DL	.) but < RL (LOC	Ω), if found, are	qualified with	a "J" flag.
<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	LOC	<u> </u>	<u>DF</u>	<u>Qualifiers</u>
Naphthalene	<0.050	0.023	0.050	0.20) 1	.00	U
2-Methylnaphthalene	<0.050	0.026	0.050	0.20) 1	.00	U
1-Methylnaphthalene	<0.050	0.028	0.050	0.20) 1	.00	U

<0.050	0.026	0.050	0.20	1.00	U	
<0.050	0.028	0.050	0.20	1.00	U	
<0.050	0.018	0.050	0.20	1.00	U	
<0.050	0.021	0.050	0.20	1.00	U	
<0.050	0.024	0.050	0.20	1.00	U	
<0.050	0.031	0.050	0.20	1.00	U	
<0.050	0.034	0.050	0.20	1.00	U	
<0.050	0.027	0.050	0.20	1.00	U	
<0.050	0.025	0.050	0.20	1.00	U	
<0.050	0.024	0.050	0.20	1.00	U	
<0.050	0.019	0.050	0.20	1.00	U	
<0.050	0.023	0.050	0.20	1.00	U	
<0.050	0.025	0.050	0.20	1.00	U	
<0.050	0.036	0.050	0.20	1.00	U	
<0.050	0.022	0.050	0.20	1.00	U	
<0.050	0.027	0.050	0.20	1.00	U	
	<0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050	<0.050	<0.050	<0.050	<0.050	<0.050

0.022

0.050

0.20

1.00

U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	90	28-139	
2-Fluorobiphenyl	86	33-144	
p-Terphenyl-d14	87	23-160	

< 0.050

07/22/14

14-07-1466

EPA 5030C



Analytical Report

Environmental Science International, Inc.

Date Received:

Work Order:

Kailua, HI 96734-2500 Preparation:

Method: GC/MS / EPA 8260B

Units: ug/L

Project: Red Hill LTM 11206	66					Pi	age 1 of 10
Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES103	14-07-1466-1-A	07/21/14 08:55	Aqueous	GC/MS OO	07/22/14	07/22/14 22:46	140722L025
Comment(s): - Results were ev	valuated to the MDL (DL), con	centrations >= 1	to the MDL (DI	L) but < RL (LOC	ι), if found, are	e qualified with	a "J" flag.
<u>Parameter</u>	Result	<u>DL</u>	LOD	LOC	2 .	<u>DF</u>	Qualifiers
Acetone	<10	6.0	10	20		1.00	U,ICH
Benzene	<0.50	0.14	0.50	1.0		1.00	U
Bromodichloromethane	<0.50	0.21	0.50	5.0		1.00	U
Bromoform	<1.0	0.50	1.0	10		1.00	U
Bromomethane	<5.0	3.9	5.0	20		1.00	U

2-Butanone <5.0 2.2 5.0 10 1.00 U Carbon Tetrachloride < 0.50 0.23 0.50 1.0 1.00 U Chlorobenzene < 0.50 0.17 0.50 5.0 1.00 U U Chloroethane <5.0 2.3 5.0 10 1.00 Chloroform < 0.50 0.46 0.50 5.0 1.00 U 10 U,IJ Chloromethane <2.0 1.8 2.0 1.00 Dibromochloromethane < 0.50 0.25 0.50 1.0 1.00 U 1,2-Dibromo-3-Chloropropane <2.0 2.0 10 U 1.2 1.00 1,2-Dibromoethane < 0.50 0.36 0.50 1.0 1.00 U 1,2-Dichlorobenzene < 0.50 0.46 0.50 1.0 1.00 U U 1,3-Dichlorobenzene < 0.50 0.40 0.50 1.0 1.00 < 0.50 0.50 1.00 U 1,4-Dichlorobenzene 0.43 1.0 < 0.50 0.50 5.0 1.00 U 1.1-Dichloroethane 0.28 1.2-Dichloroethane < 0.50 0.24 0.50 1.0 1.00 U 1,1-Dichloroethene < 0.50 0.43 0.50 1.0 1.00 U c-1,2-Dichloroethene < 0.50 0.48 0.50 1.0 1.00 U < 0.50 U t-1,2-Dichloroethene 0.37 0.50 1.0 1.00 1,2-Dichloropropane < 0.50 0.42 0.50 5.0 1.00 U Ü c-1,3-Dichloropropene < 0.50 0.25 0.50 1.0 1.00 t-1,3-Dichloropropene < 0.50 0.25 0.50 1.0 1.00 U < 0.50 0.50 U Ethylbenzene 0.14 1.0 1.00 Methylene Chloride <1.0 0.64 1.0 5.0 1.00 U 4-Methyl-2-Pentanone <5.0 4.4 5.0 10 1.00 U Styrene < 0.50 0.17 0.50 1.0 1.00 U 1.00 U < 0.50 0.50 1,1,1,2-Tetrachloroethane 0.40 1.0 1,1,2,2-Tetrachloroethane < 0.50 0.50 1.0 1.00 U 0.41 Tetrachloroethene < 0.50 0.39 0.50 5.0 1.00 U Toluene < 0.50 0.50 0.24 1.0 1.00 1,2,4-Trichlorobenzene <1.0 0.50 1.0 5.0 1.00 U U 1,1,1-Trichloroethane < 0.50 0.30 0.50 5.0 1.00 0.50 U Hexachloro-1,3-Butadiene < 0.50 0.32 1.0 1.00

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Environmental Science International, Inc. 354 Uluniu Street, Suite 304 Kailua, HI 96734-2500 Date Received: Work Order: Preparation: Method: 07/22/14 14-07-1466 EPA 5030C

Units:

GC/MS / EPA 8260B

ug

Project: Red Hill LTM 112066

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<u>Parameter</u>	<u>Result</u>	<u>DL</u>	LOD	LOQ	<u>DF</u>	Qualifiers
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1.00	U
Trichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1.00	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1.00	U
p/m-Xylene	<1.0	0.30	1.0	10	1.00	U
o-Xylene	<0.50	0.23	0.50	1.0	1.00	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1.00	U
Gasoline Range Organics	<30	26	30	50	1.00	U
Surrogate	Rec. (%)	Control Limits	Qualifiers			
Dibromofluoromethane	97	80-126				
1,2-Dichloroethane-d4	93	80-134				
Toluene-d8	99	80-120				
Toluene-d8-TPPH	99	88-112				
1,4-Bromofluorobenzene	94	80-120				



Environmental Science International, Inc.

354 Uluniu Street, Suite 304

Kailua, HI 96734-2500

Date Received:

07/22/14 14-07-1466

Preparation:

Work Order:

EPA 5030C

Method:

GC/MS / EPA 8260B

Units:

ug/L

Project: Red Hill LTM 112066

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument		Date/Time Analyzed	QC Batch II
ES104	14-07-1466-2-A	07/21/14 10:00	Aqueous	GC/MS OO		07/22/14 18:15	140722L02
Comment(s): - Results were evalu	uated to the MDL (DL), con	centrations >= t	o the MDL (DI	_) but < RL (LO	Q), if found, are qu	alified with	a "J" flag.
<u>Parameter</u>	<u>Result</u>	<u>DL</u>	LOD	LOG	<u>DF</u>		Qualifiers
Acetone	<10	6.0	10	20	1.00	כ	U,ICH
Benzene	<0.50	0.14	0.50	1.0	1.00	ס	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1.00)	U
Bromoform	<1.0	0.50	1.0	10	1.00	ס	U
Bromomethane	<5.0	3.9	5.0	20	1.00	כ	U
2-Butanone	<5.0	2.2	5.0	10	1.00	כ	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1.00	כ	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1.00	ס	U
Chloroethane	<5.0	2.3	5.0	10	1.00)	U
Chloroform	<0.50	0.46	0.50	5.0	1.00	כ	U
Chloromethane	<2.0	1.8	2.0	10	1.00	כ	U,IJ
Dibromochloromethane	<0.50	0.25	0.50	1.0	1.00	כ	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1.00	כ	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1.00	כ	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1.00	ס	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1.00	ס	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1.00	כ	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1.00	ס	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1.00	ס	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1.00	כ	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1.00	ס	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1.00	כ	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1.00	כ	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	כ	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	ס	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1.00	כ	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1.00)	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1.00)	U
Styrene	<0.50	0.17	0.50	1.0	1.00	כ	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1.00	ס	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1.00)	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1.00)	U
Toluene	<0.50	0.24	0.50	1.0	1.00	ס	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1.00	ס	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1.00)	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1.00	ס	U



Environmental Science International, Inc. 354 Uluniu Street, Suite 304

Kailua, HI 96734-2500

Date Received: Work Order: Preparation:

Method: Units: 07/22/14 14-07-1466

EPA 5030C GC/MS / EPA 8260B

ug/L

Project: Red Hill LTM 112066

Toluene-d8-TPPH

1,4-Bromofluorobenzene

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<u>Parameter</u>	<u>Result</u>	<u>DL</u>	LOD	LOQ	<u>DF</u>	Qualifiers
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1.00	U
Trichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1.00	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1.00	U
p/m-Xylene	<1.0	0.30	1.0	10	1.00	U
o-Xylene	0.36	0.23	0.50	1.0	1.00	J
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1.00	U
Gasoline Range Organics	48	26	30	50	1.00	J
Surrogate	Rec. (%)	Control Limits	Qualifiers			
Dibromofluoromethane	99	80-126				
1,2-Dichloroethane-d4	93	80-134				
Toluene-d8	100	80-120				

88-112

80-120

99

99

07/22/14

14-07-1466

EPA 5030C



Analytical Report

Environmental Science International, Inc.

Date Received:

Work Order:

Kailua, HI 96734-2500 Preparation:

Method: GC/MS / EPA 8260B

Units: ug/L

Project: Red Hill LTM 112066 Page 5 of 10

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES105	14-07-1466-3-A	07/21/14 10:55	Aqueous	GC/MS OO	07/22/14	07/22/14 23:13	140722L025
Comment(s): - Results were evaluated t	o the MDL (DL), con	centrations >= t	o the MDL (DI	L) but < RL (LOC	(a), if found, a	re qualified with	a "J" flag.
<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	LOC	3	<u>DF</u>	<u>Qualifiers</u>
Acetone	<10	6.0	10	20		1.00	U,ICH
Benzene	<0.50	0.14	0.50	1.0		1.00	U
Bromodichloromethane	<0.50	0.21	0.50	5.0		1.00	U
Bromoform	<1.0	0.50	1.0	10		1.00	U
Bromomethane	<5.0	3.9	5.0	20		1.00	U
2-Butanone	<5.0	2.2	5.0	10		1.00	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0		1.00	U
Chlorobenzene	<0.50	0.17	0.50	5.0		1.00	U
Chloroethane	<5.0	2.3	5.0	10		1.00	U
Chloroform	<0.50	0.46	0.50	5.0		1.00	U
Chloromethane	<2.0	1.8	2.0	10		1.00	U,IJ
Dibromochloromethane	<0.50	0.25	0.50	1.0		1.00	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10		1.00	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0		1.00	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0		1.00	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0		1.00	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0		1.00	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0		1.00	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0		1.00	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0		1.00	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0		1.00	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0		1.00	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0		1.00	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0		1.00	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0		1.00	U
Ethylbenzene	<0.50	0.14	0.50	1.0		1.00	U
Methylene Chloride	<1.0	0.64	1.0	5.0		1.00	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10		1.00	U
Styrene	<0.50	0.17	0.50	1.0		1.00	U
1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0		1.00	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0		1.00	U
Tetrachloroethene	<0.50	0.39	0.50	5.0		1.00	U
Toluene	<0.50	0.24	0.50	1.0		1.00	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0		1.00	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0		1.00	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0		1.00	U



Environmental Science International, Inc. 354 Uluniu Street, Suite 304 Kailua, HI 96734-2500

Date Received: Work Order: Preparation: Method:

07/22/14 14-07-1466 EPA 5030C

Units:

GC/MS / EPA 8260B ug/L

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Project: Red Hill LTM 112066

Parameter	Result	<u>DL</u>	LOD	LOQ	<u>DF</u>	Qualifiers
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1.00	U
Trichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1.00	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1.00	U
p/m-Xylene	<1.0	0.30	1.0	10	1.00	U
o-Xylene	0.33	0.23	0.50	1.0	1.00	J
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1.00	U
Gasoline Range Organics	49	26	30	50	1.00	J
	- (5)					
<u>Surrogate</u>	Rec. (%)	Control Limits	<u>Qualifiers</u>			
Dibromofluoromethane	99	80-126				

Surrogate	Rec. (%)	Control Lim
Dibromofluoromethane	99	80-126
1,2-Dichloroethane-d4	93	80-134
Toluene-d8	99	80-120
Toluene-d8-TPPH	98	88-112
1.4-Bromofluorohenzene	96	80-120



07/22/14

14-07-1466

EPA 5030C



Analytical Report

Environmental Science International, Inc.

Date Received:

Work Order:

Kailua, HI 96734-2500 Preparation:

Method: GC/MS / EPA 8260B

Units: ug/L
Project: Red Hill LTM 112066 Page 7 of 10

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Date/Time Prepared Analyzed	QC Batch ID
ES TRIP	14-07-1466-4-A	07/21/14 08:00	Aqueous	GC/MS OO	07/22/14 07/22/14 17:48	140722L025
Comment(s): - Results were evaluated	to the MDL (DL), con	centrations >= t	o the MDL (DL	_) but < RL (LOC), if found, are qualified with	a "J" flag.
Parameter	<u>Result</u>	<u>DL</u>	LOD	LOC	<u>DF</u>	Qualifiers
Acetone	6.5	6.0	10	20	1.00	J,ICH
Benzene	<0.50	0.14	0.50	1.0	1.00	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1.00	U
Bromoform	<1.0	0.50	1.0	10	1.00	U
Bromomethane	<5.0	3.9	5.0	20	1.00	U
2-Butanone	<5.0	2.2	5.0	10	1.00	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1.00	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1.00	U
Chloroethane	<5.0	2.3	5.0	10	1.00	U
Chloroform	<0.50	0.46	0.50	5.0	1.00	U
Chloromethane	<2.0	1.8	2.0	10	1.00	U,IJ
Dibromochloromethane	<0.50	0.25	0.50	1.0	1.00	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1.00	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1.00	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1.00	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1.00	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1.00	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1.00	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1.00	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1.00	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1.00	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1.00	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1.00	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1.00	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1.00	U
Styrene	<0.50	0.17	0.50	1.0	1.00	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1.00	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1.00	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1.00	U
Toluene	<0.50	0.24	0.50	1.0	1.00	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1.00	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1.00	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1.00	U



Environmental Science International, Inc. 354 Uluniu Street, Suite 304

Kailua, HI 96734-2500

Date Received: Work Order:

Preparation: Method:

Units:

07/22/14 14-07-1466 EPA 5030C

GC/MS / EPA 8260B

ug/L

Project: Red Hill LTM 112066

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<u>Parameter</u>	<u>Result</u>	<u>DL</u>	LOD	LOQ	<u>DF</u>	Qualifiers
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1.00	U
Trichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1.00	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1.00	U
p/m-Xylene	<1.0	0.30	1.0	10	1.00	U
o-Xylene	<0.50	0.23	0.50	1.0	1.00	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1.00	U
Gasoline Range Organics	<30	26	30	50	1.00	U
Surrogate	Rec. (%)	Control Limits	Qualifiers			
Dibromofluoromethane	99	80-126				
1.2 Diablaraathana d4	02	90 124				

Surrogate	Rec. (%)	Control Limit
Dibromofluoromethane	99	80-126
1,2-Dichloroethane-d4	92	80-134
Toluene-d8	99	80-120
Toluene-d8-TPPH	99	88-112
1.4-Bromofluorobenzene	95	80-120





Environmental Science International, Inc.

354 Uluniu Street, Suite 304

Kailua, HI 96734-2500

Date Received:

07/22/14 14-07-1466

Work Order: Preparation:

EPA 5030C

Method:

GC/MS / EPA 8260B

Units:

ug/L

Project: Red Hill LTM 112066

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-13-057-57	N/A	Aqueous	GC/MS OO	07/22/14	07/22/14 17:12	140722L025
Comment(s): - Results were evalua	ated to the MDL (DL), cor	ncentrations >= 1	to the MDL (DI	L) but < RL (LOC	Q), if found, are	e qualified with	a "J" flag.
<u>Parameter</u>	Result	<u>DL</u>	LOD	LOC	⊇ .	<u>DF</u>	Qualifiers
Acetone	<10	6.0	10	20		1.00	U
Benzene	<0.50	0.14	0.50	1.0		1.00	U
Bromodichloromethane	<0.50	0.21	0.50	5.0		1.00	U
Bromoform	<1.0	0.50	1.0	10		1.00	U
Bromomethane	<5.0	3.9	5.0	20		1.00	U
2-Butanone	<5.0	2.2	5.0	10		1.00	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0		1.00	U
Chlorobenzene	<0.50	0.17	0.50	5.0		1.00	U
Chloroethane	<5.0	2.3	5.0	10		1.00	U
Chloroform	<0.50	0.46	0.50	5.0		1.00	U
Chloromethane	<2.0	1.8	2.0	10		1.00	U
Dibromochloromethane	<0.50	0.25	0.50	1.0		1.00	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10		1.00	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0		1.00	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0		1.00	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0		1.00	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0		1.00	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0		1.00	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0		1.00	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0		1.00	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0		1.00	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0		1.00	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0		1.00	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0		1.00	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0		1.00	U
Ethylbenzene	<0.50	0.14	0.50	1.0		1.00	U
Methylene Chloride	<1.0	0.64	1.0	5.0		1.00	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10		1.00	U
Styrene	<0.50	0.17	0.50	1.0		1.00	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0		1.00	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0		1.00	U
Tetrachloroethene	<0.50	0.39	0.50	5.0		1.00	U
Toluene	<0.50	0.24	0.50	1.0		1.00	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0		1.00	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0		1.00	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0		1.00	U
Totalinoto-1,0-Datadione	-0.00	0.02	0.00	1.0		1.00	J



Environmental Science International, Inc. 354 Uluniu Street, Suite 304

Kailua, HI 96734-2500

Date Received: Work Order:

Preparation: Method:

Units:

07/22/14

14-07-1466 EPA 5030C

GC/MS / EPA 8260B

ug/L

Project: Red Hill LTM 112066

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<u>Parameter</u>	Result	<u>DL</u>	LOD	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1.00	U
Trichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1.00	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1.00	U
p/m-Xylene	<1.0	0.30	1.0	10	1.00	U
o-Xylene	<0.50	0.23	0.50	1.0	1.00	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1.00	U
Gasoline Range Organics	<30	26	30	50	1.00	U
<u>Surrogate</u>	Rec. (%)	Control Limits	Qualifiers			
Dibromofluoromethane	98	80-126				
1,2-Dichloroethane-d4	92	80-134				
Toluene-d8	99	80-120				
Toluene-d8-TPPH	98	88-112				
1,4-Bromofluorobenzene	95	80-120				



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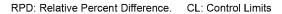
 354 Uluniu Street, Suite 304
 Work Order:
 14-07-1466

 Kailua, HI 96734-2500
 Preparation:
 EPA 3510C

 Method:
 EPA 8015B (M)

 Project: Red Hill LTM 112066
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Quality Control Sample ID	Туре		Matrix	Inst	rument	Date Prepared	Date Ana	lyzed	MS/MSD Bat	tch Number
ES104	Sample		Aqueous	GC	45	07/23/14	07/24/14	21:30	140723S11A	ı
ES104	Matrix Spike		Aqueous	GC	45	07/23/14	07/24/14	20:17	140723S11A	
ES104	Matrix Spike Du	plicate	Aqueous	GC	45	07/23/14	07/24/14	20:36	140723S11A	i.
Parameter		S <u>pike</u> Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	<u>Qualifiers</u>
TPH as Diesel	1182 2	2000	3130	97	3204	101	55-133	2	0-30	





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14-07-1466

Kailua, HI 96734-2500

Preparation:

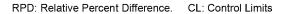
Method:

EPA 3005A Filt.

Method:

Project: Red Hill LTM 112066 Page 2 of 5

Quality Control Sample ID	Туре	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
ES104	Sample	Aqueous	ICP/MS 04	07/23/14	07/24/14 19:48	140723803
ES104	Matrix Spike	Aqueous	ICP/MS 04	07/23/14	07/24/14 19:39	140723803
ES104	Matrix Spike Duplica	e Aqueous	ICP/MS 04	07/23/14	07/24/14 19:41	140723803
Parameter	<u>Sample Spike</u> <u>Conc. Added</u>	MS Conc.	MS MSD %Rec. Conc.	MSD %Rec.	%Rec. CL RPE	RPD CL Qualifiers
Lead	ND 0.1000	0.1059	106 0.1128	113	80-120 6	0-20





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Work Order:

14-07-1466

Kailua, HI 96734-2500

Preparation:

Method:

EPA 8270C SIM PAHs

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Quality Control Sample ID	Туре		Matrix	Ir	nstrument	Date Prepared	d Date Ana	lyzed	MS/MSD Ba	tch Number
ES104	Sample		Aqueou	ıs G	C/MS AAA	07/28/14	07/29/14	21:31	140728501	
ES104	Matrix Spike		Aqueou	ıs G	C/MS AAA	07/28/14	07/29/14	13:52	140728S01	
ES104	Matrix Spike	Duplicate	Aqueou	ıs G	C/MS AAA	07/28/14	07/29/14	14:16	140728501	
<u>Parameter</u>	<u>Sample</u> <u>Conc.</u>	<u>Spike</u> <u>Added</u>	MS Conc.	<u>MS</u> %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Naphthalene	70.83	2.000	59.97	0	64.80	0	21-133	8	0-25	3
2-Methylnaphthalene	19.64	2.000	21.30	83	18.58	0	21-140	14	0-25	3
1-Methylnaphthalene	25.19	2.000	25.26	4	24.73	0	20-140	2	0-25	3
Acenaphthylene	ND	2.000	1.370	68	1.495	75	33-145	9	0-25	
Acenaphthene	0.5154	2.000	1.776	63	1.936	71	49-121	9	0-25	
Fluorene	0.2363	2.000	1.536	65	1.689	73	59-121	10	0-25	
Phenanthrene	ND	2.000	1.313	66	1.517	76	54-120	14	0-25	
Anthracene	ND	2.000	1.421	71	1.551	78	27-133	9	0-25	
Fluoranthene	ND	2.000	1.282	64	1.431	72	26-137	11	0-25	
Pyrene	ND	2.000	1.192	60	1.344	67	18-168	12	0-25	
Benzo (a) Anthracene	ND	2.000	1.252	63	1.416	71	33-143	12	0-25	
Chrysene	ND	2.000	1.298	65	1.459	73	17-168	12	0-25	
Benzo (k) Fluoranthene	ND	2.000	1.137	57	1.284	64	24-159	12	0-25	
Benzo (b) Fluoranthene	ND	2.000	1.117	56	1.282	64	24-159	14	0-25	
Benzo (a) Pyrene	ND	2.000	1.181	59	1.348	67	17-163	13	0-25	
Indeno (1,2,3-c,d) Pyrene	ND	2.000	1.190	60	1.329	66	10-171	11	0-25	
Dibenz (a,h) Anthracene	ND	2.000	1.195	60	1.342	67	10-219	12	0-25	
Benzo (g,h,i) Perylene	ND	2.000	1.252	63	1.389	69	10-227	10	0-25	





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14-07-1466

Kailua, HI 96734-2500

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EPA 5030C

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Quality Control Sample ID	Туре		Matrix	I	nstrument	Date Prepare	ed Date Ana	lyzed	MS/MSD Ba	atch Number	
ES104	Sample		Aqueous	; (GC/MS OO	07/22/14	07/22/14	18:15	140722S01	1	
ES104	Matrix Spike		Aqueous	; (GC/MS OO	07/22/14	07/22/14	07/22/14 18:42 1407225011			
ES104	Matrix Spike	Duplicate	Aqueous	, (GC/MS OO	07/22/14	07/22/14	19:10	140722801	1	
<u>Parameter</u>	<u>Sample</u> <u>Conc.</u>	<u>Spike</u> Added	MS Conc.	MS %Rec	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers	
Acetone	ND	50.00	68.38	137	67.89	136	40-140	1	0-20		
Benzene	ND	50.00	48.75	97	47.76	96	80-120	2	0-20		
Bromobenzene	ND	50.00	49.17	98	49.04	98	75-125	0	0-20		
Bromochloromethane	ND	50.00	51.02	102	50.51	101	65-135	1	0-20		
Bromodichloromethane	ND	50.00	50.05	100	48.80	98	75-120	3	0-20		
Bromoform	ND	50.00	49.04	98	47.81	96	70-130	3	0-20		
Bromomethane	ND	50.00	45.28	91	41.18	82	30-145	9	0-20		
2-Butanone	ND	50.00	51.87	104	50.83	102	30-150	2	0-20		
n-Butylbenzene	3.292	50.00	55.43	104	54.21	102	70-135	2	0-20		
sec-Butylbenzene	3.056	50.00	56.01	106	54.93	104	70-125	2	0-20		
tert-Butylbenzene	ND	50.00	53.19	106	52.66	105	70-130	1	0-20		
Carbon Disulfide	ND	50.00	37.91	76	37.81	76	35-160	0	0-20		
Carbon Tetrachloride	ND	50.00	46.80	94	46.16	92	65-140	1	0-20		
Chlorobenzene	ND	50.00	50.45	101	50.22	100	80-120	0	0-20		
Chloroethane	ND	50.00	42.16	84	42.32	85	60-135	0	0-20		
Chloroform	ND	50.00	47.60	95	47.54	95	65-135	0	0-20		
Chloromethane	ND	50.00	38.39	77	39.39	79	40-125	3	0-20		
2-Chlorotoluene	ND	50.00	51.15	102	50.66	101	75-125	1	0-20		
4-Chlorotoluene	ND	50.00	50.34	101	48.92	98	75-130	3	0-20		
Dibromochloromethane	ND	50.00	51.29	103	50.73	101	60-135	1	0-20		
1,2-Dibromo-3-Chloropropane	ND	50.00	44.35	89	44.28	89	50-130	0	0-20		
1,2-Dibromoethane	ND	50.00	48.68	97	48.61	97	80-120	0	0-20		
Dibromomethane	ND	50.00	50.83	102	50.24	100	75-125	1	0-20		
1,2-Dichlorobenzene	ND	50.00	50.78	102	50.20	100	70-120	1	0-20		
1,3-Dichlorobenzene	ND	50.00	51.20	102	50.63	101	75-125	1	0-20		
1,4-Dichlorobenzene	ND	50.00	49.14	98	48.08	96	75-125	2	0-20		
Dichlorodifluoromethane	ND	50.00	52.63	105	51.58	103	30-155	2	0-20		
1,1-Dichloroethane	ND	50.00	47.19	94	47.06	94	70-135	0	0-20		
1,2-Dichloroethane	ND	50.00	45.56	91	45.19	90	70-130	1	0-20		
1,1-Dichloroethene	ND	50.00	47.66	95	46.67	93	70-130	2	0-20		
c-1,2-Dichloroethene	ND	50.00	52.88	106	52.56	105	70-125	1	0-20		
t-1,2-Dichloroethene	ND	50.00	51.07	102	50.78	102	60-140	1	0-20		
1,2-Dichloropropane	ND	50.00	49.03	98	49.83	100	75-125	2	0-20		
1,3-Dichloropropane	ND	50.00	47.89	96	47.75	95	75-125	0	0-20		
2,2-Dichloropropane	ND	50.00	45.57	91	46.00	92	70-135	1	0-20		



Environmental Science International, Inc.

Date Received:

Work Order:

14-07-1466

Kailua, HI 96734-2500

Preparation:

Method:

GC/MS / EPA 8260B

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<u>Parameter</u>	<u>Sample</u> Conc.	<u>Spike</u> Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
1,1-Dichloropropene	ND	50.00	47.94	96	48.39	97	75-130	1	0-20	
c-1,3-Dichloropropene	ND	50.00	52.46	105	52.70	105	70-130	0	0-20	
t-1,3-Dichloropropene	ND	50.00	51.27	103	51.49	103	55-140	0	0-20	
Ethylbenzene	ND	50.00	49.73	99	49.35	99	75-125	1	0-20	
2-Hexanone	ND	50.00	51.36	103	50.46	101	55-130	2	0-20	
Isopropylbenzene	ND	50.00	54.76	110	54.15	108	75-125	1	0-20	
p-lsopropyltoluene	ND	50.00	47.57	95	46.54	93	75-130	2	0-20	
Methylene Chloride	ND	50.00	50.87	102	50.51	101	55-140	1	0-20	
4-Methyl-2-Pentanone	ND	50.00	48.77	98	49.75	100	60-135	2	0-20	
Naphthalene	63.90	50.00	115.2	103	113.4	99	55-140	2	0-20	
n-Propylbenzene	4.683	50.00	56.47	104	55.41	101	70-130	2	0-20	
Styrene	ND	50.00	51.33	103	50.88	102	65-135	1	0-20	
1,1,1,2-Tetrachloroethane	ND	50.00	48.71	97	48.14	96	80-130	1	0-20	
1,1,2,2-Tetrachloroethane	ND	50.00	51.97	104	51.20	102	65-130	1	0-20	
Tetrachloroethene	ND	50.00	43.72	87	42.36	85	45-150	3	0-20	
Toluene	ND	50.00	48.84	98	47.83	96	75-120	2	0-20	
1,2,3-Trichlorobenzene	ND	50.00	50.43	101	50.15	100	55-140	1	0-20	
1,2,4-Trichlorobenzene	ND	50.00	50.65	101	49.25	99	65-135	3	0-20	
1,1,1-Trichloroethane	ND	50.00	46.97	94	46.67	93	65-130	1	0-20	
Hexachloro-1,3-Butadiene	ND	50.00	46.84	94	45.73	91	50-140	2	0-20	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	50.00	45.86	92	44.56	89	80-130	3	0-20	
1,1,2-Trichloroethane	ND	50.00	50.20	100	49.27	99	75-125	2	0-20	
Trichloroethene	ND	50.00	48.36	97	46.73	93	70-125	3	0-20	
Trichlorofluoromethane	ND	50.00	48.95	98	47.58	95	60-145	3	0-20	
1,2,3-Trichloropropane	ND	50.00	46.90	94	47.05	94	75-125	0	0-20	
1,2,4-Trimethylbenzene	ND	50.00	51.25	103	50.42	101	75-130	2	0-20	
1,3,5-Trimethylbenzene	ND	50.00	51.97	104	51.17	102	75-130	2	0-20	
Vinyl Acetate	ND	50.00	58.38	117	57.09	114	80-120	2	0-20	
Vinyl Chloride	ND	50.00	42.41	85	41.82	84	50-145	1	0-20	
p/m-Xylene	ND	100.0	98.61	99	97.67	98	75-130	1	0-20	
o-Xylene	ND	50.00	52.60	105	51.94	104	80-120	1	0-20	
Methyl-t-Butyl Ether (MTBE)	ND	50.00	47.14	94	47.64	95	65-125	1	0-20	
Tert-Butyl Alcohol (TBA)	ND	250.0	236.1	94	230.4	92	46-154	2	0-35	
Diisopropyl Ether (DIPE)	ND	50.00	49.90	100	50.26	101	81-123	1	0-20	
Ethyl-t-Butyl Ether (ETBE)	ND	50.00	50.25	100	50.91	102	74-122	1	0-20	
Tert-Amyl-Methyl Ether (TAME)	ND	50.00	49.17	98	49.83	100	76-124	1	0-20	
Ethanol	ND	500.0	514.2	103	520.6	104	60-138	1	0-35	



Quality Control - PDS

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Type

Kailua, HI 96734-2500

Date Received:

07/22/14 14-07-1466

Work Order: Preparation:

EPA 3005A Filt.

Method:

EPA 6020

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Qualifiers

Project: Red Hill LTM 112066 Quality Control Sample ID

Date Prepared Date Analyzed PDS/PDSD Batch Matrix Instrument Number

ES104 Sample Aqueous ICP/MS 04 07/23/14 00:00 07/24/14 19:48 140723S03 ES104 PDS 07/23/14 00:00 07/24/14 19:43 140723S03 Aqueous ICP/MS 04

<u>Parameter</u> Sample Conc. Spike Added PDS Conc. PDS %Rec. %Rec. CL 0.1000 Lead ND 0.1023 102 75-125

RPD: Relative Percent Difference. CL: Control Limits



Quality Control - LCS/LCSD

Environmental Science International, Inc.

Date Received:

Work Order:

14-07-1466

Kailua, HI 96734-2500

Preparation:

Method:

EPA 8015B (M)

Project: Red Hill LTM 112066 Page 1 of 5

Quality Control Sample ID	Туре	Mat	rix	Instrument	Date Prep	ared Date	Analyzed	LCS/LCSD E	Batch Number
099-15-516-158	LCS	Aqı	ieous	GC 45	07/23/14	07/2	4/14 18:30	140723B11/	7
099-15-516-158	LCSD	Aqı	ueous	GC 45	07/23/14	07/2	4/14 18:48	140723B11/	t .
<u>Parameter</u>	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	<u>RPD</u>	RPD CL	Qualifiers
TPH as Diesel	2000	2031	102	2018	101	60-132	1	0-11	





Quality Control - LCS

Environmental Science International, Inc.
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Kailua, HI 96734-2500

Project: Red Hill LTM 112066

Date Received: Work Order: Preparation: 07/22/14 14-07-1466 EPA 3005A Filt.

Method: EPA 3005A Filt.

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Quality Control Sample ID	Туре	Matrix	Instrument Da	ate Prepared [Date Analyzed LCS Ba	tch Number
099-14-497-87	LCS	Aqueous	ICP/MS 04 07	7/23/14 (07/24/14 19:32 140723	L03D
<u>Parameter</u>		Spike Added	Conc. Recovered	LCS %Rec	. %Rec. CL	Qualifiers
Lead		0.1000	0.09175	92	80-120	





Quality Control - LCS

Environmental Science International, Inc.

Kailua, HI 96734-2500

Date Received:

07/22/14 14-07-1466

354 Uluniu Street, Suite 304

Project: Red Hill LTM 112066

Work Order: Preparation:

EPA 3510C

Method:

EPA 8270C SIM PAHs

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Quality Control Sample ID	Туре	Matrix	Instrument [Date Prepared Date	Analyzed LCS Ba	tch Number
099-15-148-52	LCS	Aqueous	GC/MS AAA 0	07/28/14 07/29	9/14 13:28 140728	L01
<u>Parameter</u>		Spike Added	Conc. Recovered	d LCS %Rec.	%Rec. CL	Qualifiers
Naphthalene		2.000	1.361	68	21-133	
2-Methylnaphthalene		2.000	1.230	61	21-140	
1-Methylnaphthalene		2.000	1.226	61	20-140	
Acenaphthylene		2.000	1.167	58	33-145	
Acenaphthene		2.000	1.271	64	55-121	
Fluorene		2.000	1.315	66	59-121	
Phenanthrene		2.000	1.379	69	54-120	
Anthracene		2.000	1.393	70	27-133	
Fluoranthene		2.000	1.385	69	26-137	
Pyrene		2.000	1.333	67	45-129	
Benzo (a) Anthracene		2.000	1.343	67	33-143	
Chrysene		2.000	1.447	72	17-168	
Benzo (k) Fluoranthene		2.000	1.265	63	24-159	
Benzo (b) Fluoranthene		2.000	1.294	65	24-159	
Benzo (a) Pyrene		2.000	1.273	64	17-163	
Indeno (1,2,3-c,d) Pyrene		2.000	1.408	70	25-175	
Dibenz (a,h) Anthracene		2.000	1.350	67	25-175	
Benzo (g,h,i) Perylene		2.000	1.500	75	25-157	

RPD: Relative Percent Difference. CL: Control Limits



Quality Control - LCS/LCSD

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Project: Red Hill LTM 112066

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07/22/14

Work Order: Preparation:

14-07-1466 EPA 5030C

Method:

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Quality Control Sample ID	Туре	Mat	trix	Instrument	Date Pre	pared Date	Analyzed	LCS/LCSD B	atch Numbe
099-13-057-57	LCS	Aqı	ueous	GC/MS OO	07/22/14	07/22	2/14 15:40	140722L025	
099-13-057-57	LCSD	Aqı	ueous	GC/MS OO	07/22/14	07/22	2/14 16:07	140722L025	
<u>Parameter</u>	Spike Added	LCS Conc.	<u>LCS</u> %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Acetone	50.00	88.82	178	N/A	N/A	40-140	N/A	0-20	Χ
Benzene	50.00	49.88	100	N/A	N/A	80-120	N/A	0-20	
Bromobenzene	50.00	49.40	99	N/A	N/A	75-125	N/A	0-20	
Bromochloromethane	50.00	50.20	100	N/A	N/A	65-130	N/A	0-20	
Bromodichloromethane	50.00	49.69	99	N/A	N/A	75-120	N/A	0-20	
Bromoform	50.00	50.09	100	N/A	N/A	70-130	N/A	0-20	
Bromomethane	50.00	41.76	84	N/A	N/A	30-145	N/A	0-20	
2-Butanone	50.00	64.52	129	N/A	N/A	30-150	N/A	0-20	
n-Butylbenzene	50.00	54.15	108	N/A	N/A	70-135	N/A	0-20	
sec-Butylbenzene	50.00	55.17	110	N/A	N/A	70-125	N/A	0-20	
tert-Butylbenzene	50.00	54.15	108	N/A	N/A	70-130	N/A	0-20	
Carbon Disulfide	50.00	40.26	81	N/A	N/A	35-160	N/A	0-20	
Carbon Tetrachloride	50.00	49.66	99	N/A	N/A	65-140	N/A	0-20	
Chlorobenzene	50.00	51.79	104	N/A	N/A	80-120	N/A	0-20	
Chloroethane	50.00	42.88	86	N/A	N/A	60-135	N/A	0-20	
Chloroform	50.00	48.16	96	N/A	N/A	65-135	N/A	0-20	
Chloromethane	50.00	39.99	80	N/A	N/A	40-125	N/A	0-20	
2-Chlorotoluene	50.00	51.99	104	N/A	N/A	75-125	N/A	0-20	
4-Chlorotoluene	50.00	51.09	102	N/A	N/A	75-130	N/A	0-20	
Dibromochloromethane	50.00	50.95	102	N/A	N/A	60-135	N/A	0-20	
1,2-Dibromo-3-Chloropropane	50.00	47.49	95	N/A	N/A	50-130	N/A	0-20	
1,2-Dibromoethane	50.00	48.66	97	N/A	N/A	80-120	N/A	0-20	
Dibromomethane	50.00	50.64	101	N/A	N/A	75-125	N/A	0-20	
1,2-Dichlorobenzene	50.00	51.35	103	N/A	N/A	70-120	N/A	0-20	
1,3-Dichlorobenzene	50.00	52.64	105	N/A	N/A	75-125	N/A	0-20	
1,4-Dichlorobenzene	50.00	49.60	99	N/A	N/A	75-125	N/A	0-20	
Dichlorodifluoromethane	50.00	55.16	110	N/A	N/A	30-155	N/A	0-20	
1,1-Dichloroethane	50.00	48.68	97	N/A	N/A	70-135	N/A	0-20	
1,2-Dichloroethane	50.00	45.73	91	N/A	N/A	70-130	N/A	0-20	
1,1-Dichloroethene	50.00	50.18	100	N/A	N/A	70-130	N/A	0-20	
c-1,2-Dichloroethene	50.00	54.08	108	N/A	N/A	70-125	N/A	0-20	
t-1,2-Dichloroethene	50.00	52.36	105	N/A	N/A	60-140	N/A	0-20	
1,2-Dichloropropane	50.00	49.64	99	N/A	N/A	75-125	N/A	0-20	
1,3-Dichloropropane	50.00	47.76	96	N/A	N/A	75-125	N/A	0-20	
2,2-Dichloropropane	50.00	49.18	98	N/A	N/A	70-135	N/A	0-20	

RPD: Relative Percent Difference.

1,1-Dichloropropene

CL: Control Limits

50.36

50.00

N/A

N/A

75-130

N/A

101

0-20



Quality Control - LCS/LCSD

Environmental Science International, Inc. 354 Uluniu Street, Suite 304

Kailua, HI 96734-2500

Project: Red Hill LTM 112066

Date Received:

Work Order:
Preparation:

Method:

07/22/14 14-07-1466 EPA 5030C

GC/MS / EPA 8260B Page 5 of 5

<u>Parameter</u>	Spike Added	LCS Conc.	<u>LCS</u> %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
c-1,3-Dichloropropene	50.00	53.61	107	N/A	N/A	70-130	N/A	0-20	
t-1,3-Dichloropropene	50.00	53.53	107	N/A	N/A	55-140	N/A	0-20	
Ethylbenzene	50.00	51.23	102	N/A	N/A	75-125	N/A	0-20	
2-Hexanone	50.00	57.37	115	N/A	N/A	55-130	N/A	0-20	
Isopropylbenzene	50.00	53.77	108	N/A	N/A	75-125	N/A	0-20	
p-Isopropyltoluene	50.00	49.20	98	N/A	N/A	75-130	N/A	0-20	
Methylene Chloride	50.00	51.33	103	N/A	N/A	55-140	N/A	0-20	
4-Methyl-2-Pentanone	50.00	53.25	107	N/A	N/A	60-135	N/A	0-20	
Naphthalene	50.00	50.18	100	N/A	N/A	55-140	N/A	0-20	
n-Propylbenzene	50.00	53.12	106	N/A	N/A	70-130	N/A	0-20	
Styrene	50.00	52.08	104	N/A	N/A	65-135	N/A	0-20	
1,1,1,2-Tetrachloroethane	50.00	48.97	98	N/A	N/A	80-130	N/A	0-20	
1,1,2,2-Tetrachloroethane	50.00	50.50	101	N/A	N/A	65-130	N/A	0-20	
Tetrachloroethene	50.00	51.35	103	N/A	N/A	45-150	N/A	0-20	
Toluene	50.00	49.99	100	N/A	N/A	75-120	N/A	0-20	
1,2,3-Trichlorobenzene	50.00	50.65	101	N/A	N/A	55-140	N/A	0-20	
1,2,4-Trichlorobenzene	50.00	50.31	101	N/A	N/A	65-135	N/A	0-20	
1,1,1-Trichloroethane	50.00	48.83	98	N/A	N/A	65-130	N/A	0-20	
Hexachloro-1,3-Butadiene	50.00	48.70	97	N/A	N/A	50-140	N/A	0-20	
1,1,2-Trichloro-1,2,2-Trifluoroethane	50.00	48.22	96	N/A	N/A	80-130	N/A	0-20	
1,1,2-Trichloroethane	50.00	49.34	99	N/A	N/A	75-125	N/A	0-20	
Trichloroethene	50.00	51.40	103	N/A	N/A	70-125	N/A	0-20	
Trichlorofluoromethane	50.00	50.79	102	N/A	N/A	60-145	N/A	0-20	
1,2,3-Trichloropropane	50.00	48.87	98	N/A	N/A	75-125	N/A	0-20	
1,2,4-Trimethylbenzene	50.00	52.46	105	N/A	N/A	75-130	N/A	0-20	
1,3,5-Trimethylbenzene	50.00	52.49	105	N/A	N/A	75-130	N/A	0-20	
Vinyl Acetate	50.00	56.14	112	N/A	N/A	80-120	N/A	0-20	
Vinyl Chloride	50.00	43.53	87	N/A	N/A	50-145	N/A	0-20	
p/m-Xylene	100.0	101.3	101	N/A	N/A	75-130	N/A	0-20	
o-Xylene	50.00	53.13	106	N/A	N/A	80-120	N/A	0-20	
Methyl-t-Butyl Ether (MTBE)	50.00	47.94	96	N/A	N/A	65-125	N/A	0-20	
Tert-Butyl Alcohol (TBA)	250.0	229.7	92	N/A	N/A	46-154	N/A	0-25	
Diisopropyl Ether (DIPE)	50.00	49.67	99	N/A	N/A	81-123	N/A	0-20	
Ethyl-t-Butyl Ether (ETBE)	50.00	50.76	102	N/A	N/A	74-122	N/A	0-20	
Tert-Amyl-Methyl Ether (TAME)	50.00	49.96	100	N/A	N/A	76-124	N/A	0-20	
Ethanol	500.0	497.8	100	N/A	N/A	60-138	N/A	0-25	
Gasoline Range Organics	1000	1036	104	1019	102	80-120	2	0-20	



Sample Analysis Summary Report

Work Order: 14-07-1466				Page 1 of 1
Method	Extraction	Chemist ID	Instrument	Analytical Location
EPA 6020	EPA 3005A Filt.	598	ICP/MS 04	1
EPA 8015B (M)	EPA 3510C	628	GC 45	1
EPA 8270C SIM PAHs	EPA 3510C	923	GC/MS AAA	1
GC/MS / EPA 8260B	EPA 5030C	849	GC/MS OO	2

Location 1: 7440 Lincoln Way, Garden Grove, CA 92841 Location 2: 7445 Lampson Avenue, Garden Grove, CA 92841



Glossary of Terms and Qualifiers

Work Order: 14-07-1466 Page 1 of 1

Qualifiers	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
В	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
DL	The Detection Limit (DL) is the smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence.
Ε	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
ICH	Initial calibration verification recovery is above the control limit for this analyte.
ICJ	Initial calibration verification recovery is below the control limit for this analyte.
IH	Calibration verification recovery is above the control limit for this analyte.
IJ	Calibration verification recovery is below the control limit for this analyte.
J	Analyte was detected at a concentration below the LOQ and above the DL. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
LOD	The Limit of Detection (LOD) is the smallest amount or concentration of a substance that must be present in a sample in order to be detected at 99% confidence level.
LOQ	The Limit of Quantitation (LOQ) is the lowest concentration of a substance that produces a quantitative result within specified limits of precision and bias.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
U	Undetected at Detection Limit (DL) and is reported as less than the Limit of Detection (LOD).
Х	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

Richard Villafania

From:

Ann Dang [ADang@esciencei.com] Monday, July 21, 2014 6:14 PM Richard Villafania

Sent: To:

Cc:

Domonkos Feher; Traci Sylva; Jeff Hattemer

Subject:

112066 Red Hill shipment 7/21/14

Attachments:

COC 7-21-14.pdf

Hi Richard,

We shipped 2 coolers today, which you should receive tomorrow. The Fedex tracking is 804557917456 and 780042307911.

On the COC, the method VOCs (8260) should be marked. Corrections were made on the attached COC.

Thanks,

Ann

Click here to report this email as spam.



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MILL PECIPIENT

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SAMPLE CONTROL
CALSCIENCE LABORATORIES
7440 LINCOLN WAY

GARDEN GROVE CA 92841

(714) 895 - 5494

DEPT:

FedEX Express

2 of 2 MPS# 7800 4230 7911 Mstr# 8045 5791 7456 TUE - 22 JUL AA STANDARD OVERNIGHT

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WZ APVA

92841 ca-us SNA



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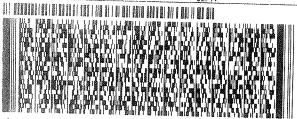
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(714) 885-5494

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FedEx Express

1 of 2 TRK# 8045 5791 7456 ## MASTER ##

TUE — 22 JUL AA STANDARD OVERNIGHT

WZ APVA

92841 ca-us SNA (h6b)



Calscience

WORK ORDER #: 14-07- 1

SAMPLE RECEIPT FORM

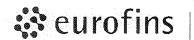
Cooler 1 of 2

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CUSTODY SEALS INTACT:					
□ Cooler □	□ No (Not Intact)	□ Not Present	□ N/A	Checked	by: <u>LS</u>
☑Sample □	함께 이 경험을 보고 있습니다. 그렇게 하고 있다면 되었다.	☐ Not Present		Checked	by: <u>65</u> 9
SAMPLE CONDITION:			Yes	No	N/A
Chain-Of-Custody (COC) docum	nent(s) received with sam	ıples	.⊿′		
COC document(s) received com	plete		.ø		
☐ Collection date/time, matrix, and/o			化电子 医多种性 医多种性 医多种性性		
☐ No analysis requested. ☐ Not	relinquished.	ne relinquished.			
Sampler's name indicated on Co	OC		Ø		
Sample container label(s) consis	stent with COC		Ø		
Sample container(s) intact and g					
Proper containers and sufficient					
Analyses received within holding	g time		ø		
Aqueous samples received v					
□ pH □ Residual Chlorine □	Dissolved Sulfides ☐ Disso	lved Oxygen	. 🗆		ď
Proper preservation noted on Co	OC or sample container.		.ø		
☑ Unpreserved vials received fo	r Volatiles analysis				
Volatile analysis container(s) fre	e of headspace		. d		
Tedlar bag(s) free of condensati	ion:		. 🗖		Z
Solid: □4ozCGJ □8ozCGJ	□16ozCGJ □Sleeve () □EnCore	sٍ® □Ţerra	ıCores [®] □	
Aqueous: ØVOA ØVOAh □V	DA na₂ □125AGB □125A	AGB h □125AGBp	Z1AGB	□1AGB na ₂	□1AGB s
□500AGB Ø500AGJ □500A					
□250PB	하시 경험 문화 생생님 하는 것이 되었다. 그 사람들은 그 그 사람들은 사람들이 되었다면 하다.				
Air: □Tedlar® □Canister Othe	r: 🖂 Trin Rlani	clot# 140422	A Labeler	//Checked b	v: 659
Container: C: Clear A: Amber P: Plastic	G: Glass J: Jar B: Bottle Z: Ziplo	:/Resealable Bag E: E	nvelope	Reviewed b	y: <u>72</u> \$

Preservative: h: HCL n: HNO₃ na₂:Na₂S₂O₃ na: NaOH p: H₃PO₄ s: H₂SO₄ u: Ultra-pure znna: ZnAc₂+NaOH f: Filtered Scanned by: 77 g

* (-2) Received 10-vials, 4-1AGB, 3-500AGT, 3-250 PBny (G)

SOP T100_090 (06/02/14)



Calscience

WORK ORDER #: **14-07-** □ [

SAMPLE RECEIPT FORM Cooler 2 of 2

CLIENT: Env. Science	DATE:	07/22	/14_
TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0 °C – 6.0 °C, not froz	en except s	ediment/tissu	e)
Temperature 2 • 4 °C - 0.3 °C (CF) = 2 •) °C	Blank	☐ Sampl	e
☐ Sample(s) outside temperature criteria (PM/APM contacted by:)		•	
☐ Sample(s) outside temperature criteria but received on ice/chilled on same	day of samp	lina	
☐ Received at ambient temperature, placed on ice for transport by C			
Ambient Temperature: Air Filter	ourier.	Checked b	w. 15
Ambient reinperature. 🗆 Ali 🗀 i ilici		Oncorea a	у
CUSTODY SEALS INTACT:			
□ Cooler □ □ No (Not Intact) □ Not Present	: □ N/A	Checked b	y: <u>LS</u>
☑ Sample □ □ No (Not Intact) □ Not Present	•	Checked b	y: 659
			A1/A
SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	້ ໆ		
COC document(s) received complete			
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels	5.		
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished. Sampler's name indicated on COC			
		p	
Sample container label(s) consistent with COC	2		
SN .	,		
Proper containers and sufficient volume for analyses requested			
Analyses received within holding time	. 上	Ш	
Aqueous samples received within 15-minute holding time		, 1	
□ pH □ Residual Chlorine □ Dissolved Sulfides □ Dissolved Oxygen			<u> </u>
Proper preservation noted on COC or sample container	Ł		
☐ Unpreserved vials received for Volatiles analysis Volatile analysis container(s) free of headspace	П	П	-
Tedlar bag(s) free of condensation			7
CONTAINER TYPE:	ப		پکا
Solid: 4ozCGJ 8ozCGJ 16ozCGJ Sleeve () EnCore	es [®] □Terra	aCores [®] □_	
Aqueous: □VOA □VOAh □VOAna₂ □125AGB □125AGBh □125AGB	⊅,ZÍ1AGB	□1AGB na ₂ [□1AGB s
□500AGB ☑500AGJ □500AGJs □250AGB □250CGB □250CGB	s □1PB	□1PB na □	1500PB
□250PB □250PBn □125PB □125PB znna □100PJ □100PJ na ₂ □_			
Air: ☐Tedlar® ☐Canister Other: ☐ Trip Blank Lot#: Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: E		/Checked by Reviewed by:	
Preservative: h: HCL n: HNO₃ na₂:Na₂S₂O₃ na: NaOH p: H₃PO₄ s: H₂SO₄ u: Ultra-pure znna: ZnAc₂+N		N. N. N. S.	.1

RAW DATA SHEET FOR METHOD: EPA 8015B (M)

WORK ORDER:

14-07-1466

INSTRUMENT:

GC 45

EXTRACTION:

EPA 3510C

D/T EXTRACTED: 2014-07-23 00:00

ANALYZED BY: D/T ANALYZED:

628

2014-07-24 21:13

REVIEWED BY:

D/T REVIEWED:

DATA FILE:

W:\GC 45\GC 45 DATA\2014\140724\14072415.D\14072415

1

CLIENT SAMPLE NUMBER: ES103

LCS/MB BATCH: MS/MSD BATCH: 140723B11A 140723S11A

ug/L

SAMPLE VOLUME / WEIGHT: FINAL VOLUME / WEIGHT:

DEFAULT: 500.00 ml / ACTUAL: 500.00 ml

DEFAULT: 5.00 ml / ACTUAL: 2.50 ml

ADJUSTMENT RATIO TO PF:

0.50

COMMENT:

UNITS:

Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are

qualified with a "J" flag.

INI. CONC DF

CONC

DL

LOD 12

LOQ

QUAL

COMPOUND TPH as Diesel

13300

1.00

66.7

J. 12 B

11

25

b

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072415.D

Page Number : 1

Operator : 682 Vial Number : Vial 15

Instrument Method: C:\CHEM32\1\METHODS\ ->

Acquired on : 24 Jul 14 9:13:38 PM

Report Created on: 25 Jul 14 06:11 pm Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies

	n W:\GC_45\G Ret Time	C 45 DATA\2014 Area	\140724\ -> Height	Peak V	√idth	Response %
			**********			.
1	2.142	0.41	0	VV	0.027	0.030
2	2.142	5.28		VV	0.026	0.392
3	2.299	1.55		VV	0.018	0.115
3 4	2.335	1.49		VV	0.020	0.110
5	2.382	1.89		VV	0.020	0.140
	2.402	0.98		vv	0.015	0.073
6 7	2.435	1.27	•	VV	0.020	0.094
8	2.475	3.67	2	VV	0.025	0.273
9	2.513	5.66	4	VV	0.024	0.420
10	2.559	4.22		vv 0.	0.026	0.314
11	2.593	2.54		VV	0.023	0.189
12	2.647	5.64	2	vv ^a :	0.039	0.419
13	2.688	5.74		VV	0.033	0.427
14	2.777	13.85	4		0.047	1.030
15	2.808	10.68		VV	0.029	0.794
16	2.870	5.38		VV	0.020	0.400
17	2.886	3.77		VV	0.013	0.280
18	2.907	8.36		VV	0.020	0.622
19	2.938	11.55		VV	0.020	0.859
20	2.997	17.08		VV	0.044	1.269
21	3.063	10.17		VV	0.033	0.756
22	3.104	5.33		VV	0.020	0.396
23	3.123	2.22		VV	0.012	0.165
24	3.147	7.96		VV	0.028	0.592
25	3.220	20.24		VV	0.026	1.504
26	3.246	4.01		VV	0.021	0.298
27	3.286	5.37		VV	0.028	0.399
28	3,357	12.11	3	VV · ·	0.046	0.900
29	3.387	7.69	.3	VV	0.035	0.571
30	3.438	2.67	2	VV.	0.021	0.199
31	3.497	9.95	3	VV	0.044	0.739
32	3.549	9.61	3	AA	0.047	0.714
33	3.616	8.98	3	VV	0.040	0.667
34	3.661	4.05	3		0.022	0.301
35	3.699	4.70	2	VV	0.029	0.349
36	3.744	5.38	2	VV	0.033	0.400
37	3.772	3.19	2	VV :	0.023	0.237
38	3.806	4.31	2	VV	0.029	0.320
39	3.833	2.79	2	$\nabla \nabla$	0.027	0.208
40	3.872	2.04	2	VΛ	0.019	0.151
41	3.896	2.75	2		0.021	0.204
42	3.912	2.87		VV	0.030	0.213
43	3.960	2.17		VV	0.021	0.161
44	3.986	5.24	. 2	VV	0.042	0.389
45	4.058	4.90	3	VV	0.022	0.364

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072415.D

Page Number : 2

Operator : 682 Vial Number : Vial 15

Instrument : GC 45 Injection Number : 1
Sample Name : 14-07-1466-1 Sequence Line : 15

Instrument Method: C:\CHEM32\1\METHODS\ ->

Acquired on : 24 Jul 14 9:13:38 PM

Report Created on: 25 Jul 14 06:11 pm Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies

Pk	Ret Time	Area	Height	Peak	Width	Response %
~ ~ ~						
46	4.099	2.43	1	VV	0.041	0.180
47	4.166	1.21	1	VV	0.030	0.090
48	4.218	1.17	1	VV	0.028	0.087
49	4.267	1.72	1	$\Delta \Lambda$	0.032	0.128
50	4.307	0.61	.0	VV'	0.028	0.045
51	4.351	0.33	0	VV	0.025	0.024
52	4.390	0.41	0	VV	0.024	0.030
53	4.424	1.06	1	VB	0.030	0.079
54	4.566	0.00	0	BV	0.000	0.000
55	4.602	0.29	0	VB	0.021	0.021
56	4.681	0.85	1	BV	0.018	0.063
57	4.713	2.88	. 2	VV .	0.024	0.214
58	4.748	0.54	0	VB	0.021	0.040
59	4.860	0.30	0	BV.	0.023	0.022
60	4.910	0.61	0	VV	0.022	0.045
61	4.967	0.35	ρ	VB	0.020	0.026
62	5.028	0.26	0	BV	0.017	0.019
63	5.059	1.69	1	$\Delta\Delta$	0.022	0.126
64	5.124	0.06	0	VV	0.031	0.004
65	5.205	1.43	1	VV	0.023	0.106
66	5.259	0.58	0	VV	0,035	0.043
67	5.353	1065.17	811	VV	0.020	79.157

Total area = 1345.64

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072415.D

Page Number : 3

Operator : 682

682 Via

Instrument : GC 45 Sample Name : 14-07-1466-1 Vial Number : Vial 15

Injection Number: 1 Sequence Line: 15

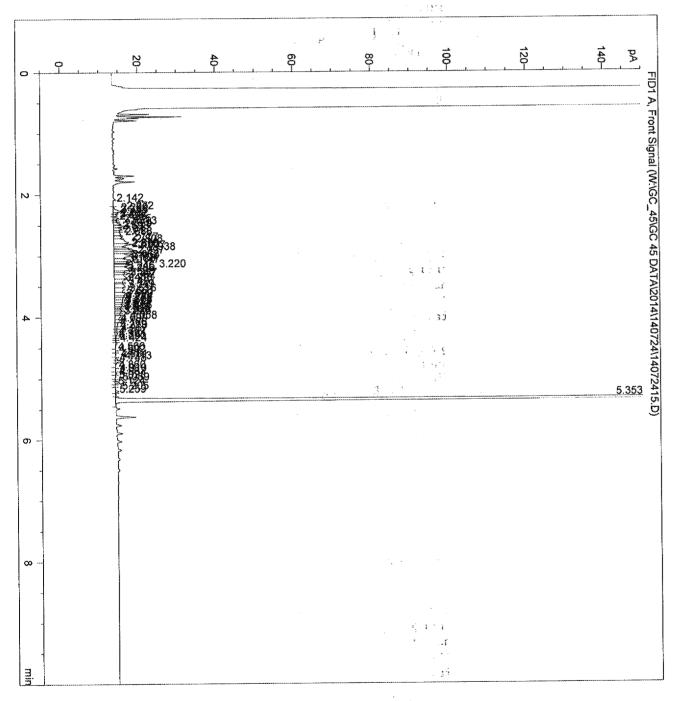
Instrument Method: C:\CHEM32\1\METHODS\

Acquired on : 24 Jul 14 9:13:38 PM

Report Created on: 25 Jul 14 06:11 pm

Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies



RAW DATA SHEET FOR METHOD: EPA 8015B (M)

WORK ORDER:

14-07-1466

INSTRUMENT:

GC 45

EXTRACTION:

EPA 3510C

D/T EXTRACTED:

2014-07-23 00:00

ANALYZED BY:

D/T ANALYZED:

2014-07-24 21:30

628

REVIEWED BY: D/T REVIEWED:

DATA FILE:

W:\GC 45\GC 45 DATA\2014\140724\14072416.D\14072416

2

LCS/MB BATCH:

MS/MSD BATCH:

ug/L

140723B11A 140723S11A

CLIENT SAMPLE NUMBER: ES104

SAMPLE VOLUME / WEIGHT: FINAL VOLUME / WEIGHT:

ADJUSTMENT RATIO TO PF:

DEFAULT: 500.00 ml / ACTUAL: 500.00 ml

DEFAULT: 5.00 ml / ACTUAL: 2.50 ml

0.50

COMMENT:

UNITS:

Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are

qualified with a "J" flag.

COMPOUND TPH as Diesel INI. CONC

236000

DF 1.00

CONC 1180

DL 11

LOD 12

QUAL LOQ

25

b

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072416.D Page Number : 1

Vial Number : Vial 16

Operator : 682
Instrument : GC 45
Sample Name : 14-07-1466-2 Injection Number: 1 Sequence Line : 16

Instrument Method: C:\CHEM32\1\METHODS\ ->

Acquired on : 24 Jul 14 9:30:56 PM

Report Created on: 29 Jul 14 01:05 pm Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies

. li Pk	.n W:\GC_45\0 Ret Time	GC 45 DATA\2014 Area	\140724\ Height	~>	Peak	Width	Response %
	1						
1 1	1.944	8.11		4	vv	0.030	0.138
2	1.994	26.82			VV	0.024	0.455
3	2.077	58.15			VV	0.016	0.987
4	2.107	28.67			VV	0.016	0.487
5	2.136	35.34			VV	0.022	0.600
6	2.220	151.81	٠		VV	0.028	2.578
7	2.271	52.19	-		VV	0.025	0.886
8	2.304	69.93			Ϋ́V	0.020	1.187
9	2.333	21.11			VV.	0.017	0.358
10	2.371	69.23			$\Delta \Delta_{\gamma}$	0.024	1.175
11	2.401	91.73			VV	0.018	1.558
12	2.436	62.19			vv	0.021	1.056
		466.71		324		0.021	7.925
13	2.507	38.11	-	28	VV :	0.019	0.647
14	2.559	79.47	a.	36	vv ^{h d}	140 0.028	1.349
15	2.596	36.59		31		0.017	0.621
16	2.616	£ .	12.0	40	447	0.029	1.310
17	2.650	77.13			VV	0.029	1.635
18	2.690	96.26		44	· VV	0.020	0.902
19	2.731	53.13		146		0.026	4.773
20	2.781	281.08		157		0.023	4.409
21	2.822	259.67			VV	0.025	0.892
22	2.871	52.51				0.010	3.225
23	2.905	189.91			VV		2.140
24	2.938	126.05			VV	0.028	3.051
25	2.998	179.68			VV	0.039	0.996
26	3.035	58.66			VV	0.017	
27	3.066	195.20			VV	0.026	3.314
28	3.111	132.36			.VV.	0.029	
29	3.145	103.41			VV	0.030	1.756
30	3.193	100.22			·VV	0.028	1.702
31	3.223	56.86		44		0.018	
32	3.242	75.74			. VV \	0.027	
33	3.282	71.53			VV	0.026	
34	3.335	132.16				.% 0.036	2.244
35	3.355	56.69			ΛΛ -		
36	3.380	94.90			VV	0.025	
37	3,413	47.97	5 4 4		$-VV_{\rm photo}$		
38	3.440	55.29			ŅΛ	0.021	
39	3.486	106.30		4.3	VV	0.032	
40	3.506	80.63		43	VV	0.025	
41	3.550	63.43			Ç VV ∵	0.022	
42	3.572	81.73			VV	0.029	
43	3.615	117.41		43	VV	0.038	
44	3.667	94.65	*	35	VV	0.038	
		38.76			. VV	0.021	0.658

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072416.D

Page Number : 2

Operator : 682 Vial Number : Vial 16

Instrument : GC 45 Injection Number : 1
Sample Name : 14-07-1466-2 Sequence Line : 16

Instrument Method: C:\CHEM32\1\METHODS\ ->

Acquired on : 24 Jul 14 9:30:56 PM

Report Created on: 29 Jul 14 01:05 pm Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies

			*********			i Tridalinh	Response %
Pk	Ret Time	Area	Height	n ga i	eak.	Width	
		00.04		 35 V	 **	0.034	1.532
46	3.745	90.24		35 V 32 V		0.034	1.101
47	3.771	64.83	•				1.292
48	3.827	76.08		25 V		0.045	0.588
4.9	3.868	34.64		20 V		0.024	0.647
50	3.907	38.12		20 V		0.027	0.411
51	3.929	24.21		18 V		0.018	0.430
52	3.953	25.33		17 V		0.024	
53	3.991	60.08		18 V		0.043	1.020
54	4.056	34.15		15 V		0.033	0.580
55	4.098	22.78	3	9 V		0.032	0.387
56	4.136	10.52		8 V		0.020	0.179
57	4.164	12.26	•	7 V		0.025	0.208
58	4.196	13.83		6 V	100	0.032	0.235
59	4.232	6.45		5 V	1.0	0.017	0.110
60	4.251	12.16		5 V	'V	0.038	0.206
61	4.307	11.66		4 V	v	0.033	0.198
62	4.352	3.90		3 V	1	0.018	0.066
63	4.384	6.84	• .		r v	0.030	0.116
64	4.419	17.93			Δ,	0.076	0.304
65	4.589	4.78		4	/V	0.053	0.081
66	4.706	11.05	eia.	àr .	V a	0.036	0.188
67	4.800	1.13			V.	0.028	0.019
68	4.856	1.60	•	3	V	0.035	0.027
69	4.906	1.18			Z V	0.031	0.020
70	4.961	1.18	.*		VV	0.030	0.020
71	5.021	0.43			7V	0.021	0.007
72	5.052	1.69		1 V		0.023	0.029
73	5.094	0.05	•	0 V		0.016	0.001
74	5.197	1.35			ŠV	0.023	0.023
75	5.249	0.42		0 V	/V	0.026	0.007
76	5.344	922.91		653 V	7 7 : .	0.023	15.671

Total area = 5889.27

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072416.D

Page Number : 3

Instrument

Sample Name

Operator : 682

: GC 45 : 14-07-1466-2 Vial Number : Vial 16

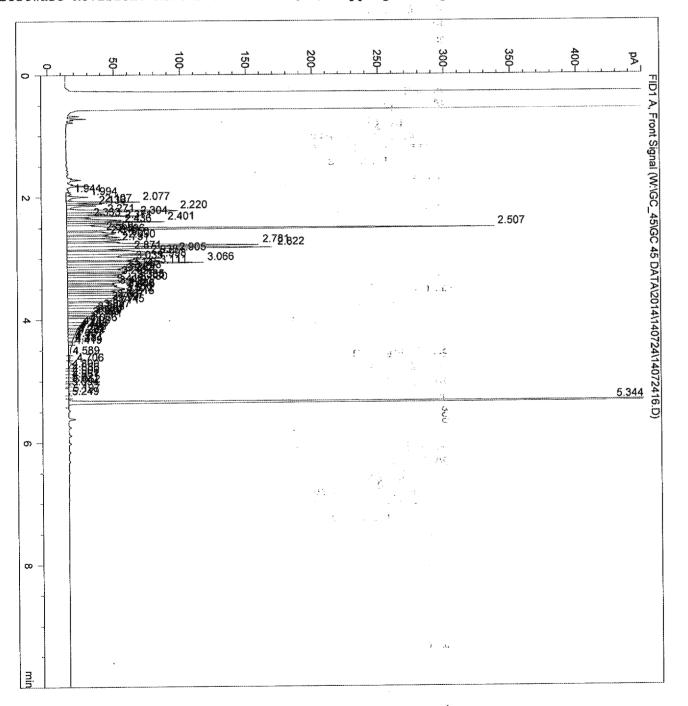
Injection Number : 1 Sequence Line : 16

Instrument Method: C:\CHEM32\1\METHODS\ -

Acquired on : 24 Jul 14 9:30:56 PM

Report Created on: 29 Jul 14 01:05 pm Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies



RAW DATA SHEET FOR METHOD: EPA 8015B (M)

11

WORK ORDER:

14-07-1466

INSTRUMENT: GC 45

EXTRACTION: D/T EXTRACTED: **EPA 3510C**

2014-07-23 00:00

ANALYZED BY:

D/T ANALYZED:

2014-07-24 21:48

628

REVIEWED BY: D/T REVIEWED:

DATA FILE:

W:\GC 45\GC 45 DATA\2014\140724\14072417.D\14072417

3

LCS/MB BATCH:

140723B11A 140723S11A SAMPLE VOLUME / WEIGHT: FINAL VOLUME / WEIGHT:

DEFAULT: 500.00 ml / ACTUAL: 500.00 ml

MS/MSD BATCH: UNITS:

ug/L

ADJUSTMENT RATIO TO PF:

4/ 11/2

DEFAULT: 5.00 ml / ACTUAL: 2.50 ml

0.50

COMMENT:

Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are

qualified with a "J" flag.

COMPOUND

INI. CONC 265000

. [

CLIENT SAMPLE NUMBER: ES105

DF 1.00 CONC 1320

13 ...

į.

a: ti

DL 11

LOD 12

LOQ 25

QUAL

b

TPH as Diesel

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072417.D

Page Number : 1

Vial Number : Vial 17

Operator : 682 Instrument : GC 45 Sample Name : 14-07-1466-3 Injection Number: 1 Sequence Line : 17

Instrument Method: C:\CHEM32\1\METHODS\ ->

Acquired on : 24 Jul 14 9:48:52 PM

Report Created on: 29 Jul 14 01:05 pm Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies

7. 1 in	W:\GC 45\G	GC 45 DATA\2014	\140724\ ->	ž - 2,		
	et Time	Area	Height	Peak W	<i>l</i> idth	Response %
-			~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~			-
1	1.945	9.80		VV	0.030	0.146
2	1.994	31.86	19	VV	0.025	0.476
3	2.077	66.79	63	VV.	0.016	0.998
4	2.107	33.21	31	VV	0.016	0.496
5	2.136	41.20	26	VV	0.024	0.616
6	2.219	176.26	96	VV	0.029	2.633
7	2.271	60.30	33	VV	0.030	0.901
8	2.304	82.33	62	VV	0.020	1.230
9	2.334	23.70	. 21	, VV	0.016	0.354
10	2.371	80.18	48	vv '	0.024	1.198
11	2.401	107.56	90	$\Delta \Delta_{ij}$	0.018	1.607
12	2.437	71.67	. 48	. VV	0.023	1.071
13	2.507	538.09	371	VV '	0.021	8.038
14	2,560	47.85	32	ΔΛ	0.021	0.715
15	2.597	87.08	40	AA fa	0.028	1.301
16	2.617	41.00	35	VV	0.017	0.612
17	2.653	85.64	44	VV	0.029	1.279
18	2.691	107.63	48	VV	0.031	1.608
19	2.731	58.32	44	vv	0.019	0.871
20	2.782	323.90	177	vv :	0.025	4.839
21	2.822	298.78	181	VV	0.023	4.463
22	2.906	264.71	89	vv	0.039	3.954
23	2.939	137.94	67	VV.	0.027	2.061
24	2,998	195.07	; 74	VV	0.038	2.914
25	3.037	68.68	57	VV	0.017	1.026
26	3.067	216.73	121	VV	0.024	3.238
27	3.111	145.33		vv	0.028	2.171
28	3.146	113.40	52	VV	0.028	1.694
29	3.194	112.52	53		0.028	1.681
30	3.223	79.27	46	VV	0.022	1.184
31	3.250	58.65	45		0.022	0.876
32	3.283	69.30	4.3	χχ \	0.023	1.035
33	3,333	135.78	56		0.032	2.028
34	3.355	75.60		VV	0.020	1.129
35	3.380	111.65		VV .	0.028	1.668
36	3.416	48.71		VV .	0.018	
37	3.441	66.84	40	VV	0.023	0.998
38	3.487	100.77		' VV	0.030	1.505
39	3.506	91.91		' VV	0.027	
40	3.551	68.65		VV	0.021	
41	3.575	89.78		VV	0.028	
42	3.617	107.77		VV	0.031	
43	3.644	34.70		VV	0.015	
44	3.667	69.31		VV	0.026	
45	3.689	59.20	i i	. VV	0.025	
* 0	5.005	33,40	J.	• • •		- ·

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072417.D

Page Number : 2

Operator : 682 Vial Number : Vial 17

Instrument : GC 45 Injection Number : 1
Sample Name : 14-07-1466-3 Sequence Line : 17

Instrument Method: C:\CHEM32\1\METHODS\ ->

Acquired on : 24 Jul 14 9:48:52 PM

Report Created on: 29 Jul 14 01:05 pm Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies

Pk	Ret Time	Area	Height	Peak	Width	Response %
						.
46	3.721	27.51	31	VV	0.015	0.411
47	3.747	70.09	40		0.023	1.047
48	3.771	73.69	34	VV	0.030	1.101
49	3.832	91.10	27	VV	0.043	1.361
50	3.872	36.78		VV	0.027	0.549
51	3.909	60.17	22	ŲV	0.036	0.899
52	3.953	33.43	19	VV	0.027	0.499
53	3.992	65.23	20	VV	0.041	0.974
54	4.058	37.63	15		0.033	0.562
55	4.100	35.70	10	VV_{\setminus}	0.044	0.533
56	4.167	15.18	8	AA ,	0.026	0.227
57	4.197	14.10		VV	0.027	0.211
58	4.229	9.65		VV	0.021	0.144
59	4.254	12.68	6	VV	0.036	0.189
60	4.303	11.50	4	VV .	0.038	0.172
61	4.349	6.21	4	VV.	0.024	0.093
62	4.386	7.68	4	VV	0.028	0.115
63	4.419	7,29	4	ΛΛα	0.029	0.109
64	4.451	2.33	3,	Ψ.,	0.015	0.035
65	4.472	7.09	3	VV	0.035	0.106
66	4.520	7.25		VV .	0.048	0.108
67	4.594	5.48		VV :	0.061	0.082
68	4.710	12.26		VV	0.052	0.183
69	4.794	2.35		VV	0.040	0.035
70	4.851	2.83		VV	0.042	0.042
71	4.905	2.36		VV	0.042	0.035
72	4.962	2.53		VV	0.044	0.038
73	5.055	4.44		VV	0.036	0.066
74	5.124	0.50		·VV	0.018	0.007
75	5.199	2.89		VV	0.034	
76	5.251	1.43		·VV	0.039	
77	5.348	1129.37	860	VΛ	0.020	16.871

Total area = 6694.13

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072417.D

Page Number : 3

Operator

: 682

Vial Number : Vial 17

Instrument : GC 45

Injection Number: 1

Sample Name : 14-07-1466-3

Sequence Line : 17

Instrument Method: C:\CHEM32\1\METHODS\

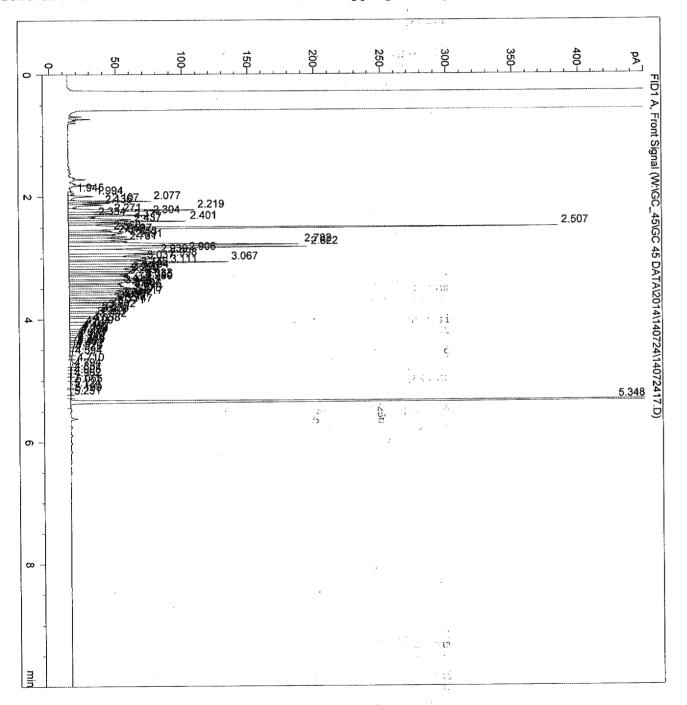
Acquired on : 24 Jul 14

: 24 Jul 14 9:48:52 PM

Report Created on: 29 Jul 14 01:05 pm

Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies



Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072405.D

Page Number : 2 Operator : 682

682 Vial Number

Instrument : GC 45

Sample Name

: MB 14072311/12

Vial Number : Vial 5

Injection Number : 1
Sequence Line : 5

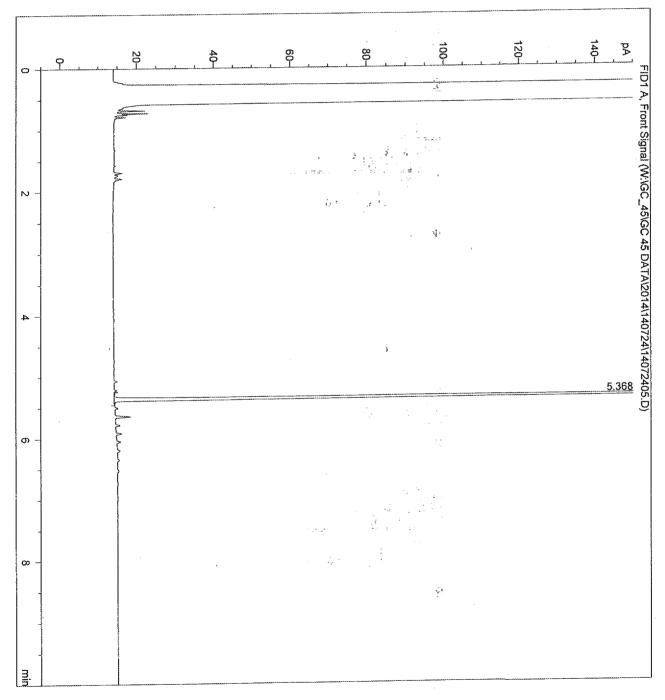
Instrument Method: C:\CHEM32\1\METHODS\ -

Acquired on : 24 Jul 14 6:11:35 PM

Report Created on: 25 Jul 14 06:10 pm

Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies



Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072403.D

?age Number

Jample Name

: 682)perator [nstrument

; GC 45

: D400 C28 50 L041814D

: Vial 3 Vial Number

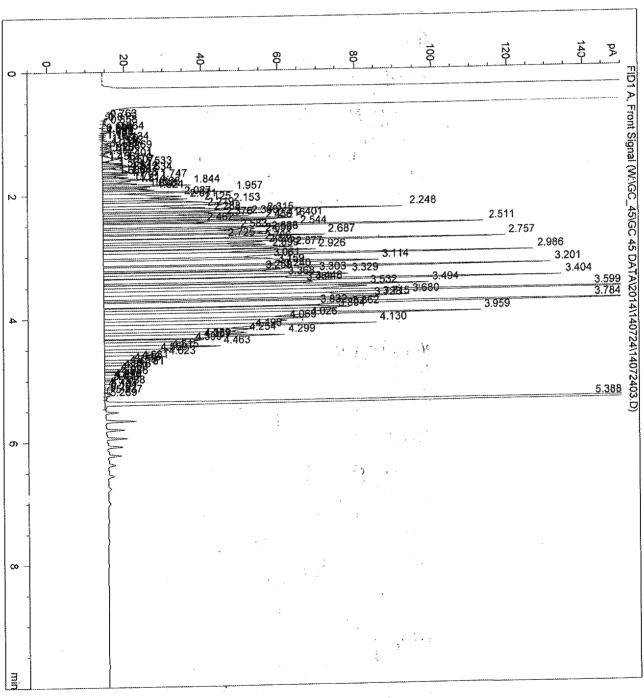
Injection Number: 1 Sequence Line

Instrument Method: C:\CHEM32\1\METHODS\

5:36:31 PM : 24 Jul 14 Acquired on

Analysis Method : 8015B.MTH Report Created on: 25 Jul 14 06:10 pm

Software Revision: Rev. B.04.03-SP1 [87] Copyright @ Agilent Technologies





Supplemental Report 1

Calscience



WORK ORDER NUMBER: 14-07-1550

The difference is service



AIR SOIL WATER | MARINE CHEMISTRY

Analytical Report For

Client: Environmental Science International, Inc.

Client Project Name: Red Hill 112066

Attention: Robert Chong

354 Uluniu Street, Suite 304 Kailua, HI 96734-2500

Rand Ollo

Approved for release on 07/30/2014 by: Richard Villafania Project Manager



Resultanka

Emailyour PM &

Eurofins Calscience, Inc. (Calscience) certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

7440 For Glo Way Carrier Screw CA 9764 (447) - TEL 17 (4) 804-5-94 - F2X (774) 804-750 - www.abrieran.com

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Contents

		Red Hill 112066 14-07-1550	
1	Work Ord	der Narrative	3
2		ample Data	
3	3.1 MS/I	Control Sample Data	5



Work Order Narrative

Work Order: 14-07-1550 Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 07/23/14. They were assigned to Work Order 14-07-1550.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

New York NELAP air certification does not certify for all reported methods and analytes, reference the accredited items here: http://www.calscience.com/PDF/New_York.pdf

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Page 1 of 1



Project: Red Hill 112066

Analytical Report

Environmental Science International, Inc.

Date Received:

Work Order:

14-07-1550

Kailua, HI 96734-2500

Preparation:

Method:

Units:

Units:

Date Received:

07/23/14

Method:

14-07-1550

Preparation:

Units:

Units:

Date Received:

07/23/14

Lab Sample Client Sample Number Date/Time Matrix Instrument Date Date/Time QC Batch ID Collected Prepared Number Analyzed ES107UF 14-07-1550-5-A 07/22/14 Aqueous ICP/MS 04 07/23/14 07/24/14 140723L02D

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter
Lead - Result - Re

Method Blank	099-16	-094-424 N/A	Aqueou	is ICP/MS 03 07	//23/14 07/: 15:	23/14 140723L02D 32
Comment(s):	- Results were evaluated to the MD	L (DL), concentration	is >= to the MDL	(DL) but < RL (LOQ), i	f found, are qualif	ied with a "J" flag.
<u>Parameter</u>		Result	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Lead		<0.0898	1.00	0.0898	1.00	U

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.

Date Received:

Work Order:

14-07-1550

Kailua, HI 96734-2500

Preparation:

Method:

Date Received:

07/23/14

Work Order:

14-07-1550

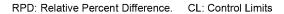
Preparation:

N/A

EPA 200.8

Project: Red Hill 112066 Page 1 of 1

Quality Control Sample ID	Туре	Matrix	Instru	ument	Date Prepared	Date Anal	yzed	MS/MSD Bat	tch Number
14-07-1564-2	Sample	Aqueous	i ICP/I	VIS 03	07/23/14	07/23/14	15:15	140723S02	
14-07-1564-2	Matrix Spike	Aqueous	i ICP/I	VIS 03	07/23/14	07/23/14	15:09	140723S02	
14-07-1564-2	Matrix Spike Duplic	ate Aqueous	i ICP/I	VIS 03	07/23/14	07/23/14	15:12	140723S02	
Parameter	<u>Sample</u> <u>Spik</u> <u>Conc.</u> Adde		<u>MS</u> %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Lead	112.2 100.	229.4	117	233.0	121	80-120	2	0-20	3





Quality Control - PDS

Environmental Science International, Inc.

Date Received:

Work Order:

14-07-1550

Kailua, HI 96734-2500

Preparation:

Method:

Date Received:

07/23/14

Mork Order:

14-07-1550

N/A

Project: Red Hill 112066 Page 1 of 1

Quality Control Sample ID	Туре	M	latrix	Instrument	Date Prepared Date		S/PDSD Batch mber
14-07-1564-2	Sample	A	queous	ICP/MS 03	07/23/14 00:00 07/23	/14 15:15 140)723S02
14-07-1564-2	PDS	A	queous	ICP/MS 03	07/23/14 00:00 07/29	/14 14:31 14(723802
Parameter		Sample Conc.	Spike Added	PDS Conc	. PDS %Rec.	%Rec. CL	<u>Qualifiers</u>
Lead		112.2	500.0	640.9	106	75-125	







Quality Control - LCS

Environmental Science International, Inc.

Date Received:

Work Order:

14-07-1550

Kailua, HI 96734-2500

Preparation:

Method:

Date Received:

07/23/14

Mork Order:

14-07-1550

N/A

Project: Red Hill 112066 Page 1 of 1

Quality Control Sample ID	Туре	Matrix	Instrument D	ate Prepared	Date Analyzed	LCS Batch Number
099-16-094-424	LCS	Aqueous	ICP/MS 03 0	7/23/14	07/23/14 15:05	140723L02D
<u>Parameter</u>		Spike Added	Conc. Recovered	LCS %Re	<u>%Rec</u>	. CL Qualifiers
Lead		100.0	95.43	95	80-120)

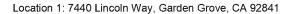


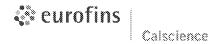




Sample Analysis Summary Report

Work Order: 14-07-1550				Page 1 of 1
Method	Extraction	Chemist ID	Instrument	Analytical Location
EPA 200.8	N/A	598	ICP/MS 04	1





Glossary of Terms and Qualifiers

Work Order: 14-07-1550 Page 1 of 1

Qualifiers	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
В	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
DL	The Detection Limit (DL) is the smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
ICH	Initial calibration verification recovery is above the control limit for this analyte.
ICJ	Initial calibration verification recovery is below the control limit for this analyte.
IH	Calibration verification recovery is above the control limit for this analyte.
IJ	Calibration verification recovery is below the control limit for this analyte.
J	Analyte was detected at a concentration below the LOQ and above the DL. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
LOD	The Limit of Detection (LOD) is the smallest amount or concentration of a substance that must be present in a sample in order to be detected at 99% confidence level.
LOQ	The Limit of Quantitation (LOQ) is the lowest concentration of a substance that produces a quantitative result within specified limits of precision and bias.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
U	Undetected at Detection Limit (DL) and is reported as less than the Limit of Detection (LOD).
Х	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unlace otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All OC results are

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

Page 10 of 12 Page 10 of 1	0	ence Environmental Laboratorie 7440 Lincoln Way, Garden Grove, CA 92841-1427 • (714) 895-5494 ther locations: Concord, San Luis Obispo, Houston, and Corous Chris	CA 92841-142 Obispo, Houst	100ra 7 • (714) on, and Co	Crics , 895-5494 rpus Christi	275		WO#/LAB USE ONLY	3 USE OI	N-Y			Date	를) `	000			CHAIN OF CUSTODY RECORD	8	0
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Richard Villafania

From: Sent:

Ann Dang [ADang@esciencei.com] Tuesday, July 22, 2014 6:34 PM Richard Villafania

To:

Cc:

Domonkos Feher; Traci Sylva; Jeff Hattemer

Subject:

112066 Red Hill shipment 7-22-14

Attachments:

COC 7-22-14.pdf

Hi Richard,

We shipped 2 coolers today, the FedEx tracking is 804557917397 and 780047104871.

For ES107UF, "field filtered" should not be marked. The correction was made on the attached COC.

Thanks,

Ann

Click here to report this email as spam.



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DISTRIBUTION: White with final report, Green and Yellow to Client. Please note that pages 1 and 2 of 2 of our T/Cs are printed on the reverse side of the Green and Yellow copies, respectively.	aport, Green and Yo 2 of our T/Cs are p	ellow to Client rinted on the r	everse si	de of the	Green and	1 Yellow o	opies, res	pectively				*	7	**************************************		01/01	01/01/14 Revision



ORIGIN ID:HNLA (808) 261-0740 ESI

354 ULUNIU ST STE 304

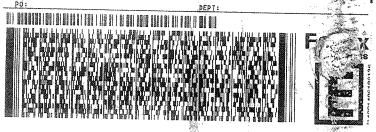
KAILUA: HI 967342532 UNITED STATES US SHIP DATE: 22JUL14 ACTWGT: 48.0 LB CAD: /POS1501 DIMS: 24x13x13 IN BILL SENDER

TO SAMPLE CONTROL CAL SCIENCE 7440 LINCOLN WAY

GARDEN GROVE CA 92841

(714) 895-5494

REF:



1 of 2 TRK# 8045 5791 7397 ## MASTER ##

WZ APVA

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ORIGIN ID:HNLA (808) 261-0740 ESI

354 ULUNIU ST STE 304

KAILUA, HI 967342532 UNITED STATES US SHIP DATE: 22JUL14 ACTWGT: 54.6 LB GAD: /PO51501 DIMS: 24×13×13 IN BILL SENJER

TO SAMPLE CONTROL CAL SCIENCE 7440 LINCOLN WAY

GARDEN GROVE CA 92841

(714)895 - 5494

REF:



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2 of 2 MPS# 7800 4710 487 Mstr# 8045 5791 7397 WED - 23 JUL AA STANDARD OVERNIGHT

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Calscience

WORK ORDER #: 14-07- ☐ 5 5 0

SAMPLE RECEIPT FORM

Cooler <u></u> of <u>2</u>

CLIENT: Env. Science.	DATE:	07/23	?/14
TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0 °C – 6.0 °C, not frozer	n except se	ediment/tiss	sue)
Temperature 2.6 °C - 0.3 °C (CF) = 2.3 °C		☐ Samp	
☐ Sample(s) outside temperature criteria (PM/APM contacted by:)		·	
☐ Sample(s) outside temperature criteria but received on ice/chilled on same da	av of samp	lina.	
☐ Received at ambient temperature, placed on ice for transport by Co		9.	
		Checked	by: <u>15</u>
Ambient Temperature: Air Filter		Oncono a	~) .
CUSTODY SEALS INTACT:			
Scooler □ □ No (Not Intact) □ Not Present	□ N/A		by: 15
Sample		Checked	by: <u>86</u>
			N 1 / A
	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples			
COC document(s) received complete	<i>ــــ</i> ر.		
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished. Sampler's name indicated on COC			П
g '			П
Sample container label(s) consistent with COC			П
	,		П
Proper containers and sufficient volume for analyses requested	<i>"</i>		. П
Analyses received within holding time	<i>y</i>	hl	<u></u>
Aqueous samples received within 15-minute holding time			
□ pH □ Residual Chlorine □ Dissolved Sulfides □ Dissolved Oxygen	as .		
Proper preservation noted on COC or sample container			<u></u>
Unpreserved vials received for Volatiles analysis		П	П
Volatile analysis container(s) free of headspace			
Tedlar bag(s) free of condensation CONTAINER TYPE:			استكلي
Solid: □4ozCGJ □8ozCGJ □16ozCGJ □Sleeve () □EnCore	s [®] □Terra	aCores [®] □]
Aqueous: ØVOA ØVOAh □VOAna ₂ □125AGB □125AGBh □125AGBp			
□500AGB ☑500AGJ □500AGJs □250AGB □250CGB □250CGBs	i □1PB	□1PBna	□500PB
□250PB ☑250PBnu□125PB □125PBznna □100PJ □100PJna ₂ □			
Air: Tedlar [®] Canister Other: Trip Blank Lot#: 131007B Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Er Preservative: h: HCL n: HNO ₃ na ₂ :Na ₂ S ₂ O ₃ na: NaOH p: H ₃ PO ₄ s: H ₂ SO ₄ u: Ultra-pure znna: ZnAc ₂ +Na	rvelope	Reviewed b	y: <u>///</u> 6



Calscience

WORK ORDER #: 14-07- 4 5 5 0

SAMPLE RECEIPT FORM

Cooler $\underline{2}$ of $\underline{2}$

CLIENT: Env. Science. DATE: 07/23/14
TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)
Temperature 2 • ℃ · C · O.3°C (CF) = 2 • 5 °C
☐ Sample(s) outside temperature criteria (PM/APM contacted by:)
☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.
☐ Received at ambient temperature, placed on ice for transport by Courier.
Ambient Temperature: Air Filter Checked by: 15
CUSTODY SEALS INTACT:
□ Cooler □ No (Not Intact) □ Not Present □ N/A Checked by: 15
☑ Sample □ □ No (Not Intact) □ Not Present Checked by:
SAMPLE CONDITION: Yes No N/A
Chain-Of-Custody (COC) document(s) received with samples
COC document(s) received complete
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.
Sampler's name indicated on COC
Sample container label(s) consistent with COC
Sample container(s) intact and good condition
Proper containers and sufficient volume for analyses requested
Analyses received within holding time
Aqueous samples received within 15-minute holding time
□ pH □ Residual Chlorine □ Dissolved Sulfides □ Dissolved Oxygen □ □ □ □
Proper preservation noted on COC or sample container
Unpreserved vials received for Volatiles analysis
Volatile analysis container(s) free of headspace
Tedlar bag(s) free of condensation CONTAINER TYPE:
Solid: □4ozCGJ □8ozCGJ □16ozCGJ □Sleeve () □EnCores® □ŢerraCores® □
Aqueous: ØVOA □VOAh □VOAna₂ □125AGB □125AGBh □125AGBp Ø1AGB □1AGBna₂ □1AGBs
□500AGB Ø500AGJ □500AGJs □250AGB □250CGB □250CGBs □1PB □1PBna □500PB
□250PB ☑250PBny□125PB □125PBznna □100PJ □100PJna2 □ □ □ □
□ 250PB □ 250PBn _W □ 125PB □ 125PBznna □ 100PJ □ 100PJna ₂ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □



Calscience

Supplemental Report 2

The original report has been revised/corrected.



WORK ORDER NUMBER: 14-07-1550

The difference is service



AIR SOIL WATER | MARINE CHEMISTRY

Analytical Report For

Client: Environmental Science International, Inc.

Client Project Name: Red Hill 112066

Attention: Robert Chong

354 Uluniu Street, Suite 304 Kailua, HI 96734-2500

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Approved for release on 07/31/2014 by: Richard Villafania Project Manager



Resultance

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Eurofins Calscience, Inc. (Calscience) certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

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NELAP DI COURCA : ACLASS DODELAP ID AGE 1004 (SOULCITIOS 2005) I OSDIACID 10:00 I SCAQNID DI RICADES



Contents

Client Project Name:	Red Hill LTM 112066
Work Order Number:	14-07-1550

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Work Order Narrative

Work Order: 14-07-1550 Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 07/23/14. They were assigned to Work Order 14-07-1550.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

New York NELAP air certification does not certify for all reported methods and analytes, reference the accredited items here: http://www.calscience.com/PDF/New York.pdf

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.



Date Received: 07/23/14 Environmental Science International, Inc. 14-07-1550 Work Order: 354 Uluniu Street, Suite 304 Preparation: EPA 3510C Kailua, HI 96734-2500 Method: EPA 8015B (M) Units: ug/L Project: Red Hill LTM 112066 Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES106		11:20	Aqueous	GC 45	07/24/14	07/25/14 09:09	140724B11B

- Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag. Comment(s):

- TPH as Diesel is quantified in the carbon range C10-C28.

Parameter Result DL LOD LOQ DF Qualifiers 1.00 TPH as Diesel 37 11 12 25 HD

Control Limits Qualifiers Surrogate Rec. (%)

51-141 n-Octacosane 91

ES107	14-07-15		/22/14 Aque :45	eous GC 45	07/24/14	07/25/14 09:28	140724B11B
Comment(s):	- Results were evaluated to the MDL	(DL), concentr	ations >= to the M	DL (DL) but < RL	(LOQ), if found, a	re qualified with a	"J" flag.
	- TPH as Diesel is quantified in the ca	arbon range C1	10-C28.				
<u>Parameter</u>	<u>R</u>	<u>esult</u>	<u>DL</u>	LOD	LOQ	<u>DF</u>	Qualifiers
TPH as Diesel	<	12	11	12	25	1.00	U

<12 Surrogate Rec. (%) **Control Limits** Qualifiers

n-Octacosane 51-141

ES108	14-07-1550-3-H	07/22/14 10:35	Aqueous GC 45	07/24/14	07/25/14 09:47	140724B11B
Comment(s):	- Results were evaluated to the MDL (DL), cor	ncentrations >=	to the MDL (DL) but < RI	(LOQ), if found,	are qualified with	a "J" flag.
	- TPH as Diesel is quantified in the carbon ran	ige C10-C28.				
<u>Parameter</u>	Result	DL	LOD	LOQ	DF	Qualifiers

11 12 25 1.00 TPH as Diesel <12

Surrogate Rec. (%) Control Limits Qualifiers

n-Octacosane 100 51-141

Method Blank	099-	-15-516-159 N	/A Aqı	GC 45	07/24/14	07/25/14 03:30	140724B11B
Comment(s):	- Results were evaluated to the N	MDL (DL), concent	rations >= to the I	MDL (DL) but < RI	(LOQ), if found,	are qualified with a	a "J" flag.
<u>Parameter</u>		Result	<u>DL</u>	LOD	LOQ	<u>DF</u>	<u>Qualifiers</u>
TPH as Diesel		<12	11	12	25	1.00	U
Surrogate		Rec. (%)	Control Limits	Qualifiers			
n-Octacosane		90	51-141				



Date Received: 07/23/14 Environmental Science International, Inc. 354 Uluniu Street, Suite 304 Work Order: 14-07-1550 Preparation: Kailua, HI 96734-2500

EPA 3005A Filt. Method: EPA 6020

Units: ug/L Project: Red Hill LTM 112066 Page 1 of 1

Client Sample I	lumber	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES106		14-07-1550-1-G	07/22/14 11:20	Aqueous	ICP/MS 04	07/23/14	07/24/14 19:53	140723L03D
Comment(s):	- Results were eva	aluated to the MDL (DL), cond	entrations >= t	o the MDL (DI	_) but < RL (LC	Q), if found, a	e qualified with	a "J" flag.
<u>Parameter</u>		<u>Result</u>	<u>DL</u>	<u>LOD</u>	LC	<u>)Q</u>	<u>DF</u>	Qualifiers
Lead		<0.200	0.0898	0.200	1.0	00	1.00	U

ES108	14	-07-1550-3-G	07/22/14 10:35	Aqueous ICP/M	/IS 04 07/23/	14 07/24/14 20:00	140723L03D
Comment(s):	- Results were evaluated to the	MDL (DL), conc	entrations >= to	the MDL (DL) but <	RL (LOQ), if fou	nd, are qualified w	rith a "J" flag.
<u>Parameter</u>		Result	<u>DL</u>	LOD	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
Lead		<0.200	0.0898	0.200	1.00	1.00	U

Method Blank	099-14-49	7-87 N/A	Aqueous	ICP/MS 04		7/24/14 140723L03D 9:24
Comment(s):	- Results were evaluated to the MDL (L), concentrations	s >= to the MDL (D	L) but < RL (LOQ), if found, are qua	lified with a "J" flag.
<u>Parameter</u>	Res	<u>ult</u> <u>DL</u>	LOD	LOQ	<u>DF</u>	<u>Qualifiers</u>
Lead	<0.:	0.08	398 0.200	1.00	1.00	U





Environmental Science International, Inc.

354 Uluniu Street, Suite 304

Kailua, HI 96734-2500

Date Received:

Work Order: Preparation:

Method: EPA 8270C SIM PAHs

Units:

Page 1 of 4

07/23/14

ug/L

14-07-1550

EPA 3510C

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time I	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID		
ES106	14-07-1550-1-J	07/22/14 11:20	Aqueous	GC/MS AAA	07/28/14	07/29/14 17:29	140728L01		
Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.									
<u>Parameter</u>	Result	<u>DL</u>	LOD	LOC	3	<u>DF</u>	<u>Qualifiers</u>		
Naphthalene	<0.047	0.022	0.047	0.19)	1.00	U		
2-Methylnaphthalene	<0.047	0.025	0.047	0.19)	1.00	U		
1-Methylnaphthalene	<0.047	0.027	0.047	0.19)	1.00	U		
Acenaphthylene	< 0.047	0.017	0.047	0.19)	1.00	U		
Acenaphthene	< 0.047	0.020	0.047	0.19)	1.00	U		
Fluorene	< 0.047	0.023	0.047	0.19)	1.00	U		
Phenanthrene	< 0.047	0.029	0.047	0.19)	1.00	U		
Anthracene	< 0.047	0.032	0.047	0.19)	1.00	U		
Fluoranthene	< 0.047	0.026	0.047	0.19)	1.00	U		
Pyrene	< 0.047	0.023	0.047	0.19)	1.00	U		
Benzo (a) Anthracene	< 0.047	0.022	0.047	0.19)	1.00	U		
Chrysene	< 0.047	0.018	0.047	0.19)	1.00	U		
Benzo (k) Fluoranthene	< 0.047	0.022	0.047	0.19)	1.00	U		
Benzo (b) Fluoranthene	< 0.047	0.024	0.047	0.19)	1.00	U		
Benzo (a) Pyrene	< 0.047	0.034	0.047	0.19)	1.00	U		
Indeno (1,2,3-c,d) Pyrene	< 0.047	0.021	0.047	0.19)	1.00	U		
Dibenz (a,h) Anthracene	< 0.047	0.025	0.047	0.19)	1.00	U		
Benzo (g,h,i) Perylene	<0.047	0.021	0.047	0.19)	1.00	U		
Surrogate	<u>Rec. (%)</u>	Control Limit	<u>ts Qualif</u>	<u>iers</u>					
Nitrobenzene-d5	78	28-139							
2-Fluorobiphenyl	78	33-144							
p-Terphenyl-d14	78	23-160							



Environmental Science International, Inc. 354 Uluniu Street, Suite 304

Kailua, HI 96734-2500

Date Received:

07/23/14 14-07-1550

Work Order: Preparation:

EPA 3510C

Method:

EPA 8270C SIM PAHs

Units:

ug/L

Project: Red Hill LTM 112066

Page 2 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID		
ES107	14-07-1550-2-H	07/22/14 09:45	Aqueous	GC/MS AAA	07/28/14	07/29/14 17:53	140728L01		
Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.									
<u>Parameter</u>	<u>Result</u>	<u>DL</u>	LOD	LOC	<u>3</u>	<u>DF</u>	<u>Qualifiers</u>		
Naphthalene	<0.048	0.022	0.048	0.19)	1.00	U		
2-Methylnaphthalene	<0.048	0.025	0.048	0.19)	1.00	U		
1-Methylnaphthalene	<0.048	0.027	0.048	0.19)	1.00	U		
Acenaphthylene	<0.048	0.017	0.048	0.19)	1.00	U		
Acenaphthene	<0.048	0.020	0.048	0.19)	1.00	U		
Fluorene	<0.048	0.023	0.048	0.19)	1.00	U		
Phenanthrene	<0.048	0.029	0.048	0.19)	1.00	U		
Anthracene	<0.048	0.033	0.048	0.19)	1.00	U		
Fluoranthene	<0.048	0.026	0.048	0.19)	1.00	U		
Pyrene	<0.048	0.024	0.048	0.19)	1.00	U		
Benzo (a) Anthracene	<0.048	0.023	0.048	0.19)	1.00	U		
Chrysene	<0.048	0.018	0.048	0.19)	1.00	U		
Benzo (k) Fluoranthene	<0.048	0.022	0.048	0.19)	1.00	U		
Benzo (b) Fluoranthene	<0.048	0.024	0.048	0.19)	1.00	U		
Benzo (a) Pyrene	<0.048	0.035	0.048	0.19)	1.00	U		
Indeno (1,2,3-c,d) Pyrene	<0.048	0.021	0.048	0.19)	1.00	U		
Dibenz (a,h) Anthracene	<0.048	0.026	0.048	0.19)	1.00	U		
Benzo (g,h,i) Perylene	<0.048	0.021	0.048	0.19)	1.00	U		
Surrogate	Rec. (%)	Control Limi	its Qualifi	ier <u>s</u>					
Nitrobenzene-d5	73	28-139							
2-Fluorobiphenyl	76	33-144							
p-Terphenyl-d14	71	23-160							



Environmental Science International, Inc.

354 Uluniu Street, Suite 304 Kailua, HI 96734-2500

Work Order: Preparation: Method:

Units:

Date Received:

EPA 3510C EPA 8270C SIM PAHs

07/23/14

ug/L

14-07-1550

Project: Red Hill LTM 112066

Page 3 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID		
ES108	14-07-1550-3-J	07/22/14 10:35	Aqueous	GC/MS AAA	07/28/14	07/29/14 18:18	140728L01		
Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.									
<u>Parameter</u>	Result	<u>DL</u>	LOD	LOG	3	<u>DF</u>	<u>Qualifiers</u>		
Naphthalene	<0.049	0.023	0.049	0.20)	1.00	U		
2-Methylnaphthalene	<0.049	0.026	0.049	0.20)	1.00	U		
1-Methylnaphthalene	<0.049	0.028	0.049	0.20)	1.00	U		
Acenaphthylene	<0.049	0.018	0.049	0.20)	1.00	U		
Acenaphthene	< 0.049	0.020	0.049	0.20)	1.00	U		
Fluorene	<0.049	0.024	0.049	0.20)	1.00	U		
Phenanthrene	< 0.049	0.030	0.049	0.20)	1.00	U		
Anthracene	<0.049	0.034	0.049	0.20)	1.00	U		
Fluoranthene	< 0.049	0.027	0.049	0.20)	1.00	U		
Pyrene	< 0.049	0.024	0.049	0.20)	1.00	U		
Benzo (a) Anthracene	< 0.049	0.023	0.049	0.20)	1.00	U		
Chrysene	<0.049	0.019	0.049	0.20)	1.00	U		
Benzo (k) Fluoranthene	< 0.049	0.023	0.049	0.20)	1.00	U		
Benzo (b) Fluoranthene	<0.049	0.024	0.049	0.20)	1.00	U		
Benzo (a) Pyrene	< 0.049	0.036	0.049	0.20)	1.00	U		
Indeno (1,2,3-c,d) Pyrene	< 0.049	0.022	0.049	0.20)	1.00	U		
Dibenz (a,h) Anthracene	< 0.049	0.026	0.049	0.20)	1.00	U		
Benzo (g,h,i) Perylene	<0.049	0.021	0.049	0.20)	1.00	U		
Surrogate	Rec. (%)	Control Limi	its Qualif	<u>iers</u>					
Nitrobenzene-d5	68	28-139							
2-Fluorobiphenyl	72	33-144							
p-Terphenyl-d14	64	23-160							



Environmental Science International, Inc.

354 Uluniu Street, Suite 304 Kailua, HI 96734-2500 Date Received:

07/23/14 14-07-1550

Work Order: Preparation:

EPA 3510C

Method:

EPA 8270C SIM PAHs

Units:

ug/L

Project: Red Hill LTM 112066

Page 4 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID			
Method Blank	099-15-148-52	N/A	Aqueous	GC/MS AAA	07/28/14	07/29/14 13:03	140728L01			
Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.										
<u>Parameter</u>	<u>Result</u>	<u>DL</u>	LOD	LOC	<u>D</u> f	=	Qualifiers			
Naphthalene	<0.050	0.023	0.050	0.20	1.0	00	U			
2-Methylnaphthalene	<0.050	0.026	0.050	0.20	1.0	00	U			
1-Methylnaphthalene	<0.050	0.028	0.050	0.20	1.0	00	U			
Acenaphthylene	<0.050	0.018	0.050	0.20	1.0	00	U			
Acenaphthene	<0.050	0.021	0.050	0.20	1.0	00	U			
Fluorene	<0.050	0.024	0.050	0.20	1.0	00	U			
Phenanthrene	< 0.050	0.031	0.050	0.20	1.0	00	U			
Anthracene	<0.050	0.034	0.050	0.20	1.0	00	U			
Fluoranthene	<0.050	0.027	0.050	0.20	1.0	00	U			
Pyrene	<0.050	0.025	0.050	0.20	1.0	00	U			
Benzo (a) Anthracene	<0.050	0.024	0.050	0.20	1.0	00	U			
Chrysene	<0.050	0.019	0.050	0.20	1.0	00	U			
Benzo (k) Fluoranthene	<0.050	0.023	0.050	0.20	1.0	00	U			
Benzo (b) Fluoranthene	<0.050	0.025	0.050	0.20	1.0	00	U			
Benzo (a) Pyrene	<0.050	0.036	0.050	0.20	1.0	00	U			
Indeno (1,2,3-c,d) Pyrene	<0.050	0.022	0.050	0.20	1.0	00	U			
Dibenz (a,h) Anthracene	<0.050	0.027	0.050	0.20	1.0	00	U			
Benzo (g,h,i) Perylene	<0.050	0.022	0.050	0.20	1.6	00	U			
	D (21)									
Surrogate	<u>Rec. (%)</u>	Control Limi	<u>ts</u> <u>Qualif</u>	<u>iers</u>						
Nitrobenzene-d5	90	28-139								
2-Fluorobiphenyl	86	33-144								
p-Terphenyl-d14	87	23-160								



Environmental Science International, Inc.

354 Uluniu Street, Suite 304

Kailua, HI 96734-2500

Date Received:

07/23/14 Work Order: 14-07-1550

Preparation:

Method:

GC/MS / EPA 8260B

Units:

ug/L

EPA 5030C

Project: Red Hill LTM 112066

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Date/Time Prepared Analyzed	QC Batch ID			
ES106	14-07-1550-1-A	07/22/14 11:20	Aqueous	GC/MS OO	07/23/14 07/23/14 17:27	140723L017			
Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.									
<u>Parameter</u>	Result	<u>DL</u>	<u>LOD</u>	LOQ	<u>DF</u>	Qualifiers			
Acetone	<10	6.0	10	20	1.00	U,ICH			
Benzene	<0.50	0.14	0.50	1.0	1.00	U			
Bromodichloromethane	<0.50	0.21	0.50	5.0	1.00	U			
Bromoform	<1.0	0.50	1.0	10	1.00	U			
Bromomethane	<5.0	3.9	5.0	20	1.00	U			
2-Butanone	<5.0	2.2	5.0	10	1.00	U			
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1.00	U			
Chlorobenzene	<0.50	0.17	0.50	5.0	1.00	U			
Chloroethane	<5.0	2.3	5.0	10	1.00	U			
Chloroform	<0.50	0.46	0.50	5.0	1.00	U			
Chloromethane	<2.0	1.8	2.0	10	1.00	U,IJ			
Dibromochloromethane	<0.50	0.25	0.50	1.0	1.00	U			
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1.00	U			
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1.00	U			
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1.00	U			
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1.00	U			
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1.00	U			
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1.00	U			
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1.00	U			
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1.00	U			
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1.00	U			
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1.00	U			
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1.00	U			
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U			
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U			
Ethylbenzene	<0.50	0.14	0.50	1.0	1.00	U			
Methylene Chloride	<1.0	0.64	1.0	5.0	1.00	U			
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1.00	U			
Styrene	<0.50	0.17	0.50	1.0	1.00	U			
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1.00	U			
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1.00	U			
Tetrachloroethene	<0.50	0.39	0.50	5.0	1.00	U			
Toluene	<0.50	0.24	0.50	1.0	1.00	U			
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1.00	U			
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1.00	U			
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1.00	U			



Environmental Science International, Inc. 354 Uluniu Street, Suite 304

Kailua, HI 96734-2500

Toluene-d8-TPPH

1,4-Bromofluorobenzene

Date Received: Work Order: Preparation:

Method: Units: 07/23/14 14-07-1550 EPA 5030C

GC/MS / EPA 8260B

ug/L

Project: Red Hill LTM 112066

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	***************************************	***************************************				
<u>Parameter</u>	Result	DL	LOD	LOQ	<u>DF</u>	Qualifiers
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1.00	U
Trichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1.00	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1.00	U
p/m-Xylene	<1.0	0.30	1.0	10	1.00	U
o-Xylene	<0.50	0.23	0.50	1.0	1.00	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1.00	U
Gasoline Range Organics	<30	26	30	50	1.00	U
Surrogate	<u>Rec. (%)</u>	Control Limits	Qualifiers			
Dibromofluoromethane	97	80-126				
1,2-Dichloroethane-d4	90	80-134				
Toluene-d8	98	80-120				

88-112

80-120

97

94



Environmental Science International, Inc.

354 Uluniu Street, Suite 304

Date Received: Work Order:

07/23/14 14-07-1550

Kailua, HI 96734-2500

Preparation:

EPA 5030C

Method:

GC/MS / EPA 8260B

Units:

ug/L

Project: Red Hill LTM 112066

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES107	14-07-1550-2-A	07/22/14 09:45	Aqueous	GC/MS 00	07/23/14	07/23/14 21:31	140723L017
Comment(s): - Results were evalu	ated to the MDL (DL), con	centrations >= t	o the MDL (DI	_) but < RL (LOC	ι), if found, ar	e qualified with	a "J" flag.
<u>Parameter</u>	Result	<u>DL</u>	LOD	LOC	<u> </u>	<u>DF</u>	<u>Qualifiers</u>
Acetone	<10	6.0	10	20		1.00	U,ICH
Benzene	<0.50	0.14	0.50	1.0		1.00	U
Bromodichloromethane	<0.50	0.21	0.50	5.0		1.00	U
Bromoform	<1.0	0.50	1.0	10		1.00	U
Bromomethane	<5.0	3.9	5.0	20		1.00	U
2-Butanone	<5.0	2.2	5.0	10		1.00	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0		1.00	U
Chlorobenzene	<0.50	0.17	0.50	5.0		1.00	U
Chloroethane	<5.0	2.3	5.0	10		1.00	U
Chloroform	<0.50	0.46	0.50	5.0		1.00	U
Chloromethane	<2.0	1.8	2.0	10		1.00	U,IJ
Dibromochloromethane	<0.50	0.25	0.50	1.0		1.00	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10		1.00	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0		1.00	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0		1.00	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0		1.00	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0		1.00	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0		1.00	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0		1.00	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0		1.00	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0		1.00	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0		1.00	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0		1.00	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0		1.00	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0		1.00	U
Ethylbenzene	<0.50	0.14	0.50	1.0		1.00	U
Methylene Chloride	<1.0	0.64	1.0	5.0		1.00	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10		1.00	U
Styrene	<0.50	0.17	0.50	1.0		1.00	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0		1.00	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0		1.00	U
Tetrachloroethene	<0.50	0.39	0.50	5.0		1.00	U
Toluene	<0.50	0.24	0.50	1.0		1.00	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0		1.00	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0		1.00	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0		1.00	U



Environmental Science International, Inc. 354 Uluniu Street, Suite 304

Kailua, HI 96734-2500

Date Received:

Work Order: Preparation:

Method: Units: 07/23/14 14-07-1550

EPA 5030C

GC/MS / EPA 8260B

ug/L

Project: Red Hill LTM 112066

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Parameter	Result	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	Qualifiers
1,1,2-Trichloroethane	< 0.50	0.38	0.50	1.0	1.00	U
Trichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1.00	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1.00	U
p/m-Xylene	<1.0	0.30	1.0	10	1.00	U
o-Xylene	<0.50	0.23	0.50	1.0	1.00	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1.00	U
Gasoline Range Organics	<30	26	30	50	1.00	U
Surrogate	Rec. (%)	Control Limits	Qualifiers			
Dibromofluoromethane	98	80-126				
400:11 11 14	0.4	00.404				

Surrogate	Rec. (%)	Control Lin
Dibromofluoromethane	98	80-126
1,2-Dichloroethane-d4	94	80-134
Toluene-d8	101	80-120
Toluene-d8-TPPH	100	88-112
1.4-Bromofluorobenzene	95	80-120



Environmental Science International, Inc.

354 Uluniu Street, Suite 304

Kailua, HI 96734-2500

Date Received:

07/23/14 14-07-1550

Work Order: Preparation:

EPA 5030C

Method:

GC/MS / EPA 8260B

Units:

ug/L

Project: Red Hill LTM 112066

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Date/Time Prepared Analyzed	QC Batch ID
ES108	14-07-1550-3-A	07/22/14 10:35	Aqueous	GC/MS OO	07/23/14 07/23/14 21:58	140723L017
Comment(s): - Results were evaluated to	the MDL (DL), con	centrations >= t	o the MDL (DI	_) but < RL (LOC	Ω), if found, are qualified with	n a "J" flag.
<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	LOC	<u>DF</u>	<u>Qualifiers</u>
Acetone	<10	6.0	10	20	1.00	U,ICH
Benzene	<0.50	0.14	0.50	1.0	1.00	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1.00	U
Bromoform	<1.0	0.50	1.0	10	1.00	U
Bromomethane	<5.0	3.9	5.0	20	1.00	U
2-Butanone	<5.0	2.2	5.0	10	1.00	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1.00	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1.00	U
Chloroethane	<5.0	2.3	5.0	10	1.00	U
Chloroform	<0.50	0.46	0.50	5.0	1.00	U
Chloromethane	<2.0	1.8	2.0	10	1.00	U,IJ
Dibromochloromethane	<0.50	0.25	0.50	1.0	1.00	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1.00	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1.00	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1.00	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1.00	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1.00	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1.00	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1.00	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1.00	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1.00	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1.00	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1.00	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1.00	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1.00	U
Styrene	<0.50	0.17	0.50	1.0	1.00	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1.00	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1.00	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1.00	U
Toluene	<0.50	0.24	0.50	1.0	1.00	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1.00	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1.00	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1.00	U



Toluene-d8-TPPH

1,4-Bromofluorobenzene

Analytical Report

Environmental Science International, Inc. 354 Uluniu Street, Suite 304 Kailua, HI 96734-2500

Date Received: Work Order: Preparation: Method:

07/23/14 14-07-1550 **EPA 5030C**

Units:

GC/MS / EPA 8260B

Page 6 of 10

ug/L

Project: Red Hill LTM 112066						Page 6 of 10
<u>Parameter</u>	Result	<u>DL</u>	LOD	LOQ	<u>DF</u>	Qualifiers
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1.00	U
Trichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1.00	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1.00	U
p/m-Xylene	<1.0	0.30	1.0	10	1.00	U
o-Xylene	<0.50	0.23	0.50	1.0	1.00	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1.00	U
Gasoline Range Organics	<30	26	30	50	1.00	U
Surrogate	Rec. (%)	Control Limits	Qualifiers			
Dibromofluoromethane	98	80-126				
1,2-Dichloroethane-d4	92	80-134				
Toluene-d8	100	80-120				

88-112

80-120

99

94

07/23/14



Analytical Report

Environmental Science International, Inc.

354 Uluniu Street, Suite 304

Kailua, HI 96734-2500

Date Received:

Work Order: 14-07-1550

Preparation: EPA 5030C

Method: GC/MS / EPA 8260B

Units: ug/L

Project: Red Hill LTM 112066 Page 7 of 10

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Date/ Prepared Analy	
ES TRIP	14-07-1550-4-A	07/22/14 08:00	Aqueous	GC/MS OO	07/23/14 07/23 21:03	/14 140723L017
Comment(s): - Results were evalua	ted to the MDL (DL), con	centrations >= t	o the MDL (DI	_) but < RL (LOC	Q), if found, are qualified	d with a "J" flag.
Parameter	Result	<u>DL</u>	LOD	LOC	<u>DF</u>	Qualifiers
Acetone	<10	6.0	10	20	1.00	U,ICH
Benzene	<0.50	0.14	0.50	1.0	1.00	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1.00	U
Bromoform	<1.0	0.50	1.0	10	1.00	U
Bromomethane	<5.0	3.9	5.0	20	1.00	U
2-Butanone	<5.0	2.2	5.0	10	1.00	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1.00	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1.00	U
Chloroethane	<5.0	2.3	5.0	10	1.00	U
Chloroform	<0.50	0.46	0.50	5.0	1.00	U
Chloromethane	<2.0	1.8	2.0	10	1.00	U,IJ
Dibromochloromethane	<0.50	0.25	0.50	1.0	1.00	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1.00	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1.00	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1.00	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1.00	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1.00	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1.00	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1.00	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1.00	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1.00	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1.00	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1.00	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1.00	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1.00	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1.00	U
Styrene	<0.50	0.17	0.50	1.0	1.00	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1.00	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1.00	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1.00	U
Toluene	<0.50	0.24	0.50	1.0	1.00	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1.00	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1.00	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1.00	U



Environmental Science International, Inc. 354 Uluniu Street, Suite 304

Kailua, HI 96734-2500

Date Received:

Work Order: Preparation:

Method: Units: 07/23/14 14-07-1550

EPA 5030C

GC/MS / EPA 8260B

ug/L

Project: Red Hill LTM 112066

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<u>Parameter</u>	Result	<u>DL</u>	<u>LOD</u>	<u>LOQ</u>	<u>DF</u>	<u>Qualifiers</u>
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1.00	U
Trichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1.00	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1.00	U
p/m-Xylene	<1.0	0.30	1.0	10	1.00	U
o-Xylene	<0.50	0.23	0.50	1.0	1.00	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1.00	U
Gasoline Range Organics	<30	26	30	50	1.00	U
Surrogate	Rec. (%)	Control Limits	Qualifiers			
Dibromofluoromethane	98	80-126				
1,2-Dichloroethane-d4	93	80-134				
Toluene-d8	100	80-120				
Toluene-d8-TPPH	99	88-112				
1,4-Bromofluorobenzene	94	80-120				



Environmental Science International, Inc.

354 Uluniu Street, Suite 304 Kailua, HI 96734-2500 Date Received:

07/23/14 14-07-1550

Work Order: Preparation:

EPA 5030C

Method:

GC/MS / EPA 8260B

Units:

ug/L

Project: Red Hill LTM 112066

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-13-057-58	N/A	Aqueous	GC/MS OO	07/23/14	07/23/14 16:50	140723L017
Comment(s): - Results were evalu	ated to the MDL (DL), cor	ncentrations >= t	o the MDL (DI	_) but < RL (LOC	Q), if found, ar	e qualified with	a "J" flag.
<u>Parameter</u>	<u>Result</u>	<u>DL</u>	<u>LOD</u>	LOC	3	<u>DF</u>	Qualifiers
Acetone	<10	6.0	10	20		1.00	U
Benzene	<0.50	0.14	0.50	1.0		1.00	U
Bromodichloromethane	<0.50	0.21	0.50	5.0		1.00	U
Bromoform	<1.0	0.50	1.0	10		1.00	U
Bromomethane	<5.0	3.9	5.0	20		1.00	U
2-Butanone	<5.0	2.2	5.0	10		1.00	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0		1.00	U
Chlorobenzene	<0.50	0.17	0.50	5.0		1.00	U
Chloroethane	<5.0	2.3	5.0	10		1.00	U
Chloroform	<0.50	0.46	0.50	5.0		1.00	U
Chloromethane	<2.0	1.8	2.0	10		1.00	U
Dibromochloromethane	<0.50	0.25	0.50	1.0		1.00	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10		1.00	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0		1.00	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0		1.00	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0		1.00	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0		1.00	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0		1.00	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0		1.00	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0		1.00	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0		1.00	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0		1.00	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0		1.00	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0		1.00	U
:-1,3-Dichloropropene	<0.50	0.25	0.50	1.0		1.00	U
Ethylbenzene	<0.50	0.14	0.50	1.0		1.00	U
Methylene Chloride	<1.0	0.64	1.0	5.0		1.00	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10		1.00	U
Styrene	<0.50	0.17	0.50	1.0		1.00	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0		1.00	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0		1.00	U
Tetrachloroethene	<0.50	0.39	0.50	5.0		1.00	U
Toluene	<0.50	0.24	0.50	1.0		1.00	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0		1.00	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0		1.00	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0		1.00	U



Environmental Science International, Inc. 354 Uluniu Street, Suite 304

Kailua, HI 96734-2500

Project: Red Hill LTM 112066

1,4-Bromofluorobenzene

Date Received:
Work Order:
Preparation:

Method: Units: 07/23/14 14-07-1550 EPA 5030C

GC/MS / EPA 8260B

ug/

Page 10 of 10

<u>Parameter</u>	Result	<u>DL</u>	LOD	LOQ	<u>DF</u>	Qualifiers
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1.00	U
Trichloroethene	<0.50	0.37	0.50	1.0	1.00	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1.00	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1.00	U
p/m-Xylene	<1.0	0.30	1.0	10	1.00	U
o-Xylene	<0.50	0.23	0.50	1.0	1.00	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1.00	U
Gasoline Range Organics	<30	26	30	50	1.00	U
<u>Surrogate</u>	Rec. (%)	Control Limits	<u>Qualifiers</u>			
Dibromofluoromethane	97	80-126				
1,2-Dichloroethane-d4	90	80-134				
Toluene-d8	99	80-120				
Toluene-d8-TPPH	98	88-112				

80-120

95



Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.

Date Received:

Work Order:

14-07-1550

Kailua, HI 96734-2500

Preparation:

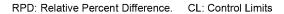
Method:

EPA 3005A Filt.

Method:

Project: Red Hill LTM 112066 Page 1 of 4

Quality Control Sample ID	Туре	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Bato	ch Number
14-07-1466-2	Sample	Aqueous	ICP/MS 04	07/23/14	07/24/14 19:48	3 140723S03	
14-07-1466-2	Matrix Spike	Aqueous	ICP/MS 04	07/23/14	07/24/14 19:39	140723503	
14-07-1466-2	Matrix Spike Duplicate	Aqueous	ICP/MS 04	07/23/14	07/24/14 19:41	I 140723S03	
Parameter	<u>Sample Spike</u> <u>Conc. Added</u>	MS M Conc. %	S MSD Rec. Conc.	<u>MSD</u> %Rec.	%Rec. CL RPI	O RPD CL	<u>Qualifiers</u>
Lead	ND 100.0	105.9 10	06 112.8	113	80-120 6	0-20	



EPA 8270C SIM PAHs



Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.

Date Received:

Work Order:

14-07-1550

Kailua, HI 96734-2500

Preparation:

Date Received:

14-07-1550

EPA 3510C

Project: Red Hill LTM 112066 Page 2 of 4

Method:

Quality Control Sample ID	Туре		Matrix	ا	nstrument	Date Prepared	l Date Ana	lyzed	MS/MSD Ba	tch Number
14-07-1466-2	Sample		Aqueous		GC/MS AAA	07/28/14	07/29/14	21:31	140728501	
14-07-1466-2	Matrix Spike		Aqueous	. (GC/MS AAA	07/28/14	07/29/14	13:52	140728501	
14-07-1466-2	Matrix Spike	Duplicate	Aqueous	. 1	GC/MS AAA	07/28/14	07/29/14	14:16	140728501	
<u>Parameter</u>	<u>Sample</u> <u>Conc.</u>	<u>Spike</u> Added	MS Conc.	MS %Rec	MSD Conc.	MSD %Rec.	%Rec. CL	<u>RPD</u>	RPD CL	Qualifiers
Naphthalene	70.83	2.000	59.97	0	64.80	0	21-133	8	0-25	3
2-Methylnaphthalene	19.64	2.000	21.30	83	18.58	0	21-140	14	0-25	3
1-Methylnaphthalene	25.19	2.000	25.26	4	24.73	0	20-140	2	0-25	3
Acenaphthylene	ND	2.000	1.370	68	1.495	75	33-145	9	0-25	
Acenaphthene	0.5154	2.000	1.776	63	1.936	71	49-121	9	0-25	
Fluorene	0.2363	2.000	1.536	65	1.689	73	59-121	10	0-25	
Phenanthrene	ND	2.000	1.313	66	1.517	76	54-120	14	0-25	
Anthracene	ND	2.000	1.421	71	1.551	78	27-133	9	0-25	
Fluoranthene	ND	2.000	1.282	64	1.431	72	26-137	11	0-25	
Pyrene	ND	2.000	1.192	60	1.344	67	18-168	12	0-25	
Benzo (a) Anthracene	ND	2.000	1.252	63	1.416	71	33-143	12	0-25	
Chrysene	ND	2.000	1.298	65	1.459	73	17-168	12	0-25	
Benzo (k) Fluoranthene	ND	2.000	1.137	57	1.284	64	24-159	12	0-25	
Benzo (b) Fluoranthene	ND	2.000	1.117	56	1.282	64	24-159	14	0-25	
Benzo (a) Pyrene	ND	2.000	1.181	59	1.348	67	17-163	13	0-25	
Indeno (1,2,3-c,d) Pyrene	ND	2.000	1.190	60	1.329	66	10-171	11	0-25	
Dibenz (a,h) Anthracene	ND	2.000	1.195	60	1.342	67	10-219	12	0-25	
Benzo (g,h,i) Perylene	ND	2.000	1.252	63	1.389	69	10-227	10	0-25	





Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.

Date Received:

Work Order:

Hard-07-1550

Weilua, HI 96734-2500

Preparation:

Date Received:

14-07-1550

Preparation:

Method: GC/MS / EPA 8260B

Project: Red Hill LTM 112066 Page 3 of 4

E\$106 Matrix Spike Aqueous Ca Ms or O7/23/14 17.64 14702 1470	Quality Control Sample ID	Туре		Matrix		Instrument	Date Prepar	ed Date Ana	lyzed	MS/MSD Ba	itch Number
Esta66 Matura Spike y Urical Agueus GCNS NO O7/23/44 O7/23/14 12/23/15 12/23/25 Parameter Sample Sono Added Conc. Add. Added Conc. Add. Added Conc. Add. Add. Conc. Add. C	ES106	Sample		Aqueou	S	GC/MS OO	07/23/14	07/23/14	17:27	140723501	1
Parameter Same (onc.) Saltie (onc.) MS (onc.) MS (onc.) MS (onc.) MS (onc.) MR (onc.) Rep. (onc.) Qualifiers Acetone ND 50.00 78.70 157 77.50 155 40.140 1 0.20 3 Benzane ND 50.00 48.76 98 48.22 96 80.120 10 0.20 1 <	ES106	Matrix Spike		Aqueou	S	GC/MS OO	07/23/14	07/23/14	17:54	140723S01	1
Conc. Adeded Conc. %Rec. Conc. %gree. Sere. Conc. %gree. Sere. Conc. %gree. 40-140 1 0-20 3 Benzene ND 50.00 48.76 98 48.22 96 80-120 1 0-20 Bromodichloromethane ND 50.00 50.15 100 49.74 99 75-120 1 0-20 Bromonethane ND 50.00 48.84 97 44.16 88 30-145 9 0-20 2-Butanone ND 50.00 54.78 110 56.44 113 30-150 3 0-20 Carbon Tetrachloride ND 50.00 50.80 102 49.44 100 80-125 1 0-20 Chloroschane ND 50.00 45.25 91 45.22 90 60-135 1 0-20 Chloroschane ND 50.00 47.61 85 48.02 9 65-135 <th>ES106</th> <th>Matrix Spike</th> <th>Duplicate</th> <th>Aqueou</th> <th>S</th> <th>GC/MS OO</th> <th>07/23/14</th> <th>07/23/14</th> <th>18:21</th> <th>140723S01</th> <th>1</th>	ES106	Matrix Spike	Duplicate	Aqueou	S	GC/MS OO	07/23/14	07/23/14	18:21	140723S01	1
Benzene ND 50.00 48.76 98 48.22 96 80.120 1 0.20	<u>Parameter</u>			MS Conc.	MS %Re	MSD c. Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Bromodichloromethane ND 50.00 59.15 100 49.50 99 75.120 1 0.20 Bromoform ND 50.00 49.49 99 49.74 99 70.130 0 0.20 Bromomethane ND 50.00 48.54 97 44.16 88 30.150 3 0.20 2-Butanone ND 50.00 56.25 93 46.61 93 65.140 1 0.20 Chlorobenzene ND 50.00 45.82 91 45.22 90 60.135 1 0.20 Chloromethane ND 50.00 47.61 95 48.02 96 65.135 1 0.20 Chloromethane ND 50.00 47.61 95 48.02 96 65.135 1 0.20 Chloromethane ND 50.00 47.61 95 48.02 96 65.135 1 0.20 LjDichromethane ND 50.00	Acetone	ND	50.00	78.70	157	77.59	155	40-140	1	0-20	3
Bromotorm ND 50.00 49.49 99 49.74 99 70.130 0 0.20 Bromomethane ND 50.00 48.54 97 44.16 88 30.145 9 0.20 2-Butanone ND 50.00 54.78 110 56.44 113 30.150 3 0.20 Carbon Tetrachloride ND 50.00 46.25 93 46.61 13 65.140 1 0.20 Chlorochane ND 50.00 45.52 91 45.22 90 60.135 1 0.20 Chlorochane ND 50.00 47.61 95 48.02 96 65-135 1 0.20 Chlorochane ND 50.00 47.81 95 48.02 96 65-135 1 0.20 Chloromethane ND 50.00 41.38 83 41.46 83 40-125 0 0.20 1,2-Dichlorochane ND 50.00 <t< td=""><td>Benzene</td><td>ND</td><td>50.00</td><td>48.76</td><td>98</td><td>48.22</td><td>96</td><td>80-120</td><td>1</td><td>0-20</td><td></td></t<>	Benzene	ND	50.00	48.76	98	48.22	96	80-120	1	0-20	
Bromomethane ND 50.00 48.54 97 44.16 88 30.145 9 0.20	Bromodichloromethane	ND	50.00	50.15	100	49.50	99	75-120	1	0-20	
2-Butlanone ND 50.00 54.78 110 56.44 113 30-150 3 0-20 Carbon Tetrachloride ND 50.00 48.25 93 46.61 93 65-140 1 0-20 Chloroebnzene ND 50.00 45.52 91 45.22 90 60-135 1 0-20 Chloroform ND 50.00 47.61 95 48.02 96 65-135 1 0-20 Chloromethane ND 50.00 41.38 83 41.46 83 40-125 0 0-20 Dibromochloromethane ND 50.00 50.97 102 51.09 102 60-135 0 0-20 1,2-Dibromoethlane ND 50.00 47.58 85 48.04 96 60-130 2 0-20 1,2-Dibromoethlane ND 50.00 50.78 102 50.89 102 70-120 0 0-20 1,2-Dibrioroethezene ND	Bromoform	ND	50.00	49.49	99	49.74	99	70-130	0	0-20	
Carbon Tetrachloride ND 50.00 46.25 93 46.61 93 65.140 1 0-20 Chlorobenzene ND 50.00 50.80 102 49.94 100 80-120 2 0-20 Chlorobethane ND 50.00 47.61 95 48.02 90 66-135 1 0-20 Chloromethane ND 50.00 47.81 95 48.02 96 65-135 1 0-20 Chloromethane ND 50.00 50.97 102 51.09 102 60-135 0 0-20 Dibromochloromethane ND 50.00 50.97 102 51.09 102 60-135 0 0-20 1,2-Dibromo-S-Chloropropane ND 50.00 47.58 95 48.04 96 80-120 1 0-20 1,2-Dibrhorobenzene ND 50.00 45.16 103 51.41 103 75-125 0 0-20 1,4-Dichlorobenzene	Bromomethane	ND	50.00	48.54	97	44.16	88	30-145	9	0-20	
Chlorobenzene ND 50.00 50.80 102 49.94 100 80-120 2 0-20 Chloroethane ND 50.00 45.52 91 45.22 90 60-135 1 0-20 Chlorofform ND 50.00 47.61 95 48.02 96 65-135 1 0-20 Chloromethane ND 50.00 41.38 83 41.46 83 40-125 0 0-20 Dibromo-3-Chloropropane ND 50.00 44.26 89 45.26 91 50.130 2 0-20 1,2-Dibromo-Bromethane ND 50.00 47.58 95 48.04 96 80-120 1 0-20 1,2-Dibromo-Bromethane ND 50.00 51.60 103 51.41 103 75-125 0 0-20 1,3-Dichlorobenzene ND 50.00 46.01 92 48.80 98 75-125 1 0-20 1,1-Dichlorobentane <td< td=""><td>2-Butanone</td><td>ND</td><td>50.00</td><td>54.78</td><td>110</td><td>56.44</td><td>113</td><td>30-150</td><td>3</td><td>0-20</td><td></td></td<>	2-Butanone	ND	50.00	54.78	110	56.44	113	30-150	3	0-20	
Chloroethane ND 50.00 45.52 91 45.22 90 60-135 1 0-20 Chloroform ND 50.00 47.61 95 48.02 96 65-135 1 0-20 Chloromethane ND 50.00 41.38 83 41.46 83 40-125 0 0-20 1,2-Dibromo-S-Chloropropane ND 50.00 44.26 89 45.26 91 50-135 2 0-20 1,2-Dibromo-S-Chloropropane ND 50.00 47.58 95 48.04 96 80-120 1 0-20 1,2-Dibromoethane ND 50.00 50.78 102 50.89 102 70-120 0 0-20 1,3-Dichlorobenzene ND 50.00 45.16 103 51.41 103 75-125 0 0-20 1,4-Dichlorobenzene ND 50.00 46.01 92 46.85 94 70-130 1 0-20 1,4-Dichlorobethane	Carbon Tetrachloride	ND	50.00	46.25	93	46.61	93	65-140	1	0-20	
Chloroform ND 50.00 47.61 95 48.02 96 65.135 1 0-20 Chloromethane ND 50.00 41.38 83 41.46 83 40-125 0 0-20 Dibromochloromethane ND 50.00 50.97 102 51.09 102 60-135 0 0-20 1,2-Dibromo-3-Chloropropane ND 50.00 44.26 89 45.26 91 50-130 2 0-20 1,2-Dibromoethane ND 50.00 47.58 95 48.04 96 80-120 1 0-20 1,2-Dichlorobenzene ND 50.00 51.60 103 51.41 103 75-125 0 0-20 1,4-Dichlorobenzene ND 50.00 46.01 92 48.80 98 75-125 1 0-20 1,4-Dichlorobethane ND 50.00 46.79 94 47.20 94 70-130 1 0-20 1,1-Dichloroethane	Chlorobenzene	ND	50.00	50.80	102	49.94	100	80-120	2	0-20	
Chloromethane ND 50.00 41.38 83 41.46 83 40-125 0 0-20 Dibromochloromethane ND 50.00 50.97 102 51.09 102 60-135 0 0-20 1,2-Dibromo-3-Chloropropane ND 50.00 44.26 89 45.26 91 50-130 2 0-20 1,2-Dichlorobenzene ND 50.00 50.78 102 50.89 102 70-120 0 0-20 1,3-Dichlorobenzene ND 50.00 51.60 103 51.41 103 75-125 0 0-20 1,4-Dichlorobenzene ND 50.00 46.01 92 46.85 94 70-135 2 0-20 1,1-Dichloroethane ND 50.00 46.31 93 45.80 92 70-130 1 0-20 1,2-Dichloroethane ND 50.00 46.79 94 47.20 94 70-130 1 0-20 -1,2-Dichloroeth	Chloroethane	ND	50.00	45.52	91	45.22	90	60-135	1	0-20	
Dibromochloromethane ND 50.00 50.97 102 51.09 102 60-135 0 0-20 1,2-Dibromo-3-Chloropropane ND 50.00 44.26 89 45.26 91 50-130 2 0-20 1,2-Dibromoethane ND 50.00 50.78 102 50.89 102 70-120 0 0 0-20 1,2-Dichlorobenzene ND 50.00 50.78 102 50.89 102 70-120 0 0 0-20 1,3-Dichlorobenzene ND 50.00 49.19 98 48.80 98 75-125 0 0-20 1,4-Dichlorobethane ND 50.00 46.01 92 46.85 94 70-130 1 0-20 1,2-Dichloroethane ND 50.00 46.79 94 47.20 94 70-130 1 0-20 1,1-Dichloroethane ND 50.00 52.45 105 52.99 106 70-130 1 0-20	Chloroform	ND	50.00	47.61	95	48.02	96	65-135	1	0-20	
1,2-Dibromo-3-Chloropropane ND 50.00 44.26 89 45.26 91 50-130 2 0-20 1,2-Dibromoethane ND 50.00 47.58 95 48.04 96 80-120 1 0-20 1,2-Dichlorobenzene ND 50.00 50.78 102 50.89 102 70-120 0 0-20 1,3-Dichlorobenzene ND 50.00 51.60 103 51.41 103 75-125 0 0-20 1,4-Dichlorobenzene ND 50.00 49.19 92 46.85 94 70-135 2 0-20 1,1-Dichloroethane ND 50.00 46.31 93 45.80 92 70-130 1 0-20 1,1-Dichloroethane ND 50.00 46.79 94 47.20 94 70-130 1 0-20 1,1-Dichloroethane ND 50.00 52.45 105 52.99 106 70-125 1 0-20 1,1-Dichloroet	Chloromethane	ND	50.00	41.38	83	41.46	83	40-125	0	0-20	
1,2-Dibromoethane ND 50.00 47.58 95 48.04 96 80-120 1 0-20 1,2-Dichlorobenzene ND 50.00 50.78 102 50.89 102 70-120 0 0-20 1,3-Dichlorobenzene ND 50.00 51.60 103 51.41 103 75-125 0 0-20 1,4-Dichlorobenzene ND 50.00 49.19 98 48.80 98 75-125 1 0-20 1,1-Dichloroethane ND 50.00 46.31 93 45.80 92 70-130 1 0-20 1,2-Dichloroethane ND 50.00 46.79 94 47.20 94 70-130 1 0-20 1,1-Dichloroethene ND 50.00 52.45 105 52.99 106 70-125 1 0-20 c-1,2-Dichloroethene ND 50.00 49.97 100 50.27 101 60-140 1 0-20 t-1,3-Dichloropropane ND 50.00 51.06 102 50.54 101 55.140	Dibromochloromethane	ND	50.00	50.97	102	51.09	102	60-135	0	0-20	
1,2-Dichlorobenzene ND 50,00 50,78 102 50,89 102 70-120 0 0-20 1,3-Dichlorobenzene ND 50,00 51,60 103 51,41 103 75-125 0 0-20 1,4-Dichlorobenzene ND 50,00 49,19 98 48,80 98 75-125 1 0-20 1,1-Dichloroethane ND 50,00 46,01 92 46,85 94 70-130 1 0-20 1,1-Dichloroethane ND 50,00 46,79 94 47,20 94 70-130 1 0-20 1,1-Dichloroethane ND 50,00 52,45 105 52,99 106 70-130 1 0-20 -1,2-Dichloroethane ND 50,00 49,92 98 48,61 97 75-125 1 0-20 -1,2-Dichloroethane ND 50,00 52,35 105 51,96 104 70-130 1 0-20 -1,3-Dichloropropa	1,2-Dibromo-3-Chloropropane	ND	50.00	44.26	89	45.26	91	50-130	2	0-20	
1,3-Dichlorobenzene ND 50.00 51.60 103 51.41 103 75-125 0 0-20 1,4-Dichlorobenzene ND 50.00 49.19 98 48.80 98 75-125 1 0-20 1,1-Dichloroethane ND 50.00 46.01 92 46.85 94 70-135 2 0-20 1,2-Dichloroethane ND 50.00 46.31 93 45.80 92 70-130 1 0-20 1,1-Dichloroethane ND 50.00 46.79 94 47.20 94 70-130 1 0-20 c-1,2-Dichloroethane ND 50.00 52.45 105 52.99 106 70-125 1 0-20 t-1,2-Dichloropthane ND 50.00 49.97 100 50.27 101 60-140 1 0-20 t-1,2-Dichloropropane ND 50.00 52.35 105 51.96 104 70-130 1 0-20 t-1,3-Dichloropropane ND 50.00 51.06 102 50.54 101 55-140 <td>1,2-Dibromoethane</td> <td>ND</td> <td>50.00</td> <td>47.58</td> <td>95</td> <td>48.04</td> <td>96</td> <td>80-120</td> <td>1</td> <td>0-20</td> <td></td>	1,2-Dibromoethane	ND	50.00	47.58	95	48.04	96	80-120	1	0-20	
1,4-Dichlorobenzene ND 50.00 49.19 98 48.80 98 75-125 1 0-20 1,1-Dichloroethane ND 50.00 46.01 92 46.85 94 70-135 2 0-20 1,2-Dichloroethane ND 50.00 46.79 94 47.20 94 70-130 1 0-20 c-1,2-Dichloroethene ND 50.00 52.45 105 52.99 106 70-125 1 0-20 t-1,2-Dichloroethene ND 50.00 49.97 100 50.27 101 60-140 1 0-20 t-1,2-Dichloropropane ND 50.00 49.97 100 50.27 101 60-140 1 0-20 c-1,3-Dichloropropane ND 50.00 49.22 98 48.61 97 75-125 1 0-20 t-1,3-Dichloropropene ND 50.00 51.06 102 50.54 101 55-140 1 0-20 Ethylbenzene ND 50.00 49.48 99 49.20 98 75-125	1,2-Dichlorobenzene	ND	50.00	50.78	102	50.89	102	70-120	0	0-20	
1,1-Dichloroethane ND 50.00 46.01 92 46.85 94 70-135 2 0-20 1,2-Dichloroethane ND 50.00 46.31 93 45.80 92 70-130 1 0-20 1,1-Dichloroethene ND 50.00 46.79 94 47.20 94 70-130 1 0-20 c-1,2-Dichloroethene ND 50.00 49.97 100 50.27 101 60-140 1 0-20 1,2-Dichloropropane ND 50.00 49.97 100 50.27 101 60-140 1 0-20 1,2-Dichloropropane ND 50.00 49.22 98 48.61 97 75-125 1 0-20 c-1,3-Dichloropropene ND 50.00 51.06 102 50.54 101 55-140 1 0-20 Ethylbenzene ND 50.00 50.57 101 50.66 101 55-140 0 0 0-20 Methyl-2-Pentanone ND 50.00 51.02 102 50.70 101 65-1	1,3-Dichlorobenzene	ND	50.00	51.60	103	51.41	103	75-125	0	0-20	
1,2-Dichloroethane ND 50.00 46.31 93 45.80 92 70-130 1 0-20 1,1-Dichloroethene ND 50.00 46.79 94 47.20 94 70-130 1 0-20 c-1,2-Dichloroethene ND 50.00 52.45 105 52.99 106 70-125 1 0-20 t-1,2-Dichloroethene ND 50.00 49.97 100 50.27 101 60-140 1 0-20 t-1,2-Dichloropropane ND 50.00 49.22 98 48.61 97 75-125 1 0-20 c-1,3-Dichloropropene ND 50.00 51.06 102 50.54 104 70-130 1 0-20 Ethylbenzene ND 50.00 51.06 102 50.54 101 55-140 1 0-20 Methylene Chloride ND 50.00 50.57 101 50.66 101 55-140 0 0 0-20 Styrene ND 50.00 48.94 98 50.04 100 65-135	1,4-Dichlorobenzene	ND	50.00	49.19	98	48.80	98	75-125	1	0-20	
1,1-Dichloroethene ND 50.00 46.79 94 47.20 94 70-130 1 0-20 c-1,2-Dichloroethene ND 50.00 52.45 105 52.99 106 70-125 1 0-20 t-1,2-Dichloroethene ND 50.00 49.97 100 50.27 101 60-140 1 0-20 1,2-Dichloropropane ND 50.00 49.22 98 48.61 97 75-125 1 0-20 c-1,3-Dichloropropene ND 50.00 52.35 105 51.96 104 70-130 1 0-20 Ethylbenzene ND 50.00 51.06 102 50.54 101 55.140 1 0-20 Ethylbenzene ND 50.00 49.48 99 49.20 98 75-125 1 0-20 Methylene Chloride ND 50.00 50.57 101 50.66 101 55-140 0 0 0-20 Styrene ND 50.00 47.91 96 47.87 96 80-130 <t< td=""><td>1,1-Dichloroethane</td><td>ND</td><td>50.00</td><td>46.01</td><td>92</td><td>46.85</td><td>94</td><td>70-135</td><td>2</td><td>0-20</td><td></td></t<>	1,1-Dichloroethane	ND	50.00	46.01	92	46.85	94	70-135	2	0-20	
c-1,2-Dichloroethene ND 50.00 52.45 105 52.99 106 70-125 1 0-20 t-1,2-Dichloroethene ND 50.00 49.97 100 50.27 101 60-140 1 0-20 1,2-Dichloropropane ND 50.00 49.22 98 48.61 97 75-125 1 0-20 c-1,3-Dichloropropene ND 50.00 52.35 105 51.96 104 70-130 1 0-20 t-1,3-Dichloropropene ND 50.00 51.06 102 50.54 101 55-140 1 0-20 Ethylbenzene ND 50.00 49.48 99 49.20 98 75-125 1 0-20 Methylene Chloride ND 50.00 50.57 101 50.66 101 55-140 0 0-20 4-Methyl-2-Pentanone ND 50.00 48.94 98 50.04 100 65-135 1 0-20 5tyrene	1,2-Dichloroethane	ND	50.00	46.31	93	45.80	92	70-130	1	0-20	
t-1,2-Dichloroethene ND 50.00 49.97 100 50.27 101 60-140 1 0-20 1,2-Dichloropropane ND 50.00 49.22 98 48.61 97 75-125 1 0-20 c-1,3-Dichloropropene ND 50.00 52.35 105 51.96 104 70-130 1 0-20 t-1,3-Dichloropropene ND 50.00 51.06 102 50.54 101 55-140 1 0-20 Ethylbenzene ND 50.00 49.48 99 49.20 98 75-125 1 0-20 Methylene Chloride ND 50.00 50.57 101 50.66 101 55-140 0 0-20 4-Methyl-2-Pentanone ND 50.00 48.94 98 50.04 100 60-135 2 0-20 Styrene ND 50.00 51.02 102 50.50 101 65-135 1 0-20 1,1,2,2-Tetrachloroethane ND 50.00 47.91 96 47.87 96 80-130 0 0-20 1,1,2,2-Tetrachloroethane ND 50.00 44.59 89 43.31 87 45-150 3 0-20 Tetrachloroethene ND 50.00 48.57 97 48.18 96 75-120 1 0-20 1,2,4-Trichlorobenzene ND 50.00 49.23 98 49.82 100 65-135 1 0-20	1,1-Dichloroethene	ND	50.00	46.79	94	47.20	94	70-130	1	0-20	
1,2-Dichloropropane ND 50.00 49.22 98 48.61 97 75-125 1 0-20 c-1,3-Dichloropropene ND 50.00 52.35 105 51.96 104 70-130 1 0-20 t-1,3-Dichloropropene ND 50.00 51.06 102 50.54 101 55-140 1 0-20 Ethylbenzene ND 50.00 49.48 99 49.20 98 75-125 1 0-20 Methylene Chloride ND 50.00 50.57 101 50.66 101 55-140 0 0-20 4-Methyl-2-Pentanone ND 50.00 48.94 98 50.04 100 60-135 2 0-20 Styrene ND 50.00 51.02 102 50.70 101 65-135 1 0-20 1,1,2,2-Tetrachloroethane ND 50.00 47.91 96 47.87 96 80-130 0 0-20 Tetrachloroethene ND 50.00 44.59 89 43.31 87 45-150 3 </td <td>c-1,2-Dichloroethene</td> <td>ND</td> <td>50.00</td> <td>52.45</td> <td>105</td> <td>52.99</td> <td>106</td> <td>70-125</td> <td>1</td> <td>0-20</td> <td></td>	c-1,2-Dichloroethene	ND	50.00	52.45	105	52.99	106	70-125	1	0-20	
c-1,3-Dichloropropene ND 50.00 52.35 105 51.96 104 70-130 1 0-20 t-1,3-Dichloropropene ND 50.00 51.06 102 50.54 101 55-140 1 0-20 Ethylbenzene ND 50.00 49.48 99 49.20 98 75-125 1 0-20 Methylene Chloride ND 50.00 50.57 101 50.66 101 55-140 0 0-20 4-Methyl-2-Pentanone ND 50.00 48.94 98 50.04 100 60-135 2 0-20 Styrene ND 50.00 47.91 96 47.87 96 80-130 0 0-20 1,1,2-Tetrachloroethane ND 50.00 44.59 89 43.31 87 45-150 3 0-20 Tetrachloroethene ND 50.00 48.57 97 48.18 96 75-120 1 0-20 1,2,4-Trichlorobenzene	t-1,2-Dichloroethene	ND	50.00	49.97	100	50.27	101	60-140	1	0-20	
t-1,3-Dichloropropene ND 50.00 51.06 102 50.54 101 55-140 1 0-20 Ethylbenzene ND 50.00 49.48 99 49.20 98 75-125 1 0-20 Methylene Chloride ND 50.00 50.57 101 50.66 101 55-140 0 0-20 4-Methyl-2-Pentanone ND 50.00 48.94 98 50.04 100 60-135 2 0-20 Styrene ND 50.00 51.02 102 50.70 101 65-135 1 0-20 1,1,1,2-Tetrachloroethane ND 50.00 47.91 96 47.87 96 80-130 0 0-20 1,1,1,2,2-Tetrachloroethane ND 50.00 52.31 105 53.33 107 65-130 2 0-20 Tetrachloroethene ND 50.00 44.59 89 43.31 87 45-150 3 0-20 Toluene ND 50.00 48.57 97 48.18 96 75-120 1 0-20 1,2,4-Trichlorobenzene ND 50.00 49.23 98 49.82 100 65-135 1 0-20	1,2-Dichloropropane	ND	50.00	49.22	98	48.61	97	75-125	1	0-20	
Ethylbenzene ND 50.00 49.48 99 49.20 98 75-125 1 0-20 Methylene Chloride ND 50.00 50.57 101 50.66 101 55-140 0 0-20 4-Methyl-2-Pentanone ND 50.00 48.94 98 50.04 100 60-135 2 0-20 Styrene ND 50.00 51.02 102 50.70 101 65-135 1 0-20 1,1,2-Tetrachloroethane ND 50.00 47.91 96 47.87 96 80-130 0 0-20 1,1,2,2-Tetrachloroethane ND 50.00 52.31 105 53.33 107 65-130 2 0-20 Tetrachloroethane ND 50.00 44.59 89 43.31 87 45-150 3 0-20 Toluene ND 50.00 48.57 97 48.18 96 75-120 1 0-20 1,2,4-Trichlorobenzene <td< td=""><td>c-1,3-Dichloropropene</td><td>ND</td><td>50.00</td><td>52.35</td><td>105</td><td>51.96</td><td>104</td><td>70-130</td><td>1</td><td>0-20</td><td></td></td<>	c-1,3-Dichloropropene	ND	50.00	52.35	105	51.96	104	70-130	1	0-20	
Methylene Chloride ND 50.00 50.57 101 50.66 101 55-140 0 0-20 4-Methyl-2-Pentanone ND 50.00 48.94 98 50.04 100 60-135 2 0-20 Styrene ND 50.00 51.02 102 50.70 101 65-135 1 0-20 1,1,1,2-Tetrachloroethane ND 50.00 47.91 96 47.87 96 80-130 0 0-20 1,1,2,2-Tetrachloroethane ND 50.00 52.31 105 53.33 107 65-130 2 0-20 Tetrachloroethane ND 50.00 44.59 89 43.31 87 45-150 3 0-20 Toluene ND 50.00 48.57 97 48.18 96 75-120 1 0-20 1,2,4-Trichlorobenzene ND 50.00 49.23 98 49.82 100 65-135 1 0-20	t-1,3-Dichloropropene	ND	50.00	51.06	102	50.54	101	55-140	1	0-20	
4-Methyl-2-Pentanone ND 50.00 48.94 98 50.04 100 60-135 2 0-20 Styrene ND 50.00 51.02 102 50.70 101 65-135 1 0-20 1,1,1,2-Tetrachloroethane ND 50.00 47.91 96 47.87 96 80-130 0 0-20 1,1,2,2-Tetrachloroethane ND 50.00 52.31 105 53.33 107 65-130 2 0-20 Tetrachloroethane ND 50.00 44.59 89 43.31 87 45-150 3 0-20 Toluene ND 50.00 48.57 97 48.18 96 75-120 1 0-20 1,2,4-Trichlorobenzene ND 50.00 49.23 98 49.82 100 65-135 1 0-20	Ethylbenzene	ND	50.00	49.48	99	49.20	98	75-125	1	0-20	
Styrene ND 50.00 51.02 102 50.70 101 65-135 1 0-20 1,1,1,2-Tetrachloroethane ND 50.00 47.91 96 47.87 96 80-130 0 0-20 1,1,2,2-Tetrachloroethane ND 50.00 52.31 105 53.33 107 65-130 2 0-20 Tetrachloroethene ND 50.00 44.59 89 43.31 87 45-150 3 0-20 Toluene ND 50.00 48.57 97 48.18 96 75-120 1 0-20 1,2,4-Trichlorobenzene ND 50.00 49.23 98 49.82 100 65-135 1 0-20	Methylene Chloride	ND	50.00	50.57	101	50.66	101	55-140	0	0-20	
1,1,1,2-Tetrachloroethane ND 50.00 47.91 96 47.87 96 80-130 0 0-20 1,1,2,2-Tetrachloroethane ND 50.00 52.31 105 53.33 107 65-130 2 0-20 Tetrachloroethene ND 50.00 44.59 89 43.31 87 45-150 3 0-20 Toluene ND 50.00 48.57 97 48.18 96 75-120 1 0-20 1,2,4-Trichlorobenzene ND 50.00 49.23 98 49.82 100 65-135 1 0-20	4-Methyl-2-Pentanone	ND	50.00	48.94	98	50.04	100	60-135	2	0-20	
1,1,2,2-Tetrachloroethane ND 50.00 52.31 105 53.33 107 65-130 2 0-20 Tetrachloroethene ND 50.00 44.59 89 43.31 87 45-150 3 0-20 Toluene ND 50.00 48.57 97 48.18 96 75-120 1 0-20 1,2,4-Trichlorobenzene ND 50.00 49.23 98 49.82 100 65-135 1 0-20	Styrene	ND	50.00	51.02	102	50.70	101	65-135	1	0-20	
Tetrachloroethene ND 50.00 44.59 89 43.31 87 45-150 3 0-20 Toluene ND 50.00 48.57 97 48.18 96 75-120 1 0-20 1,2,4-Trichlorobenzene ND 50.00 49.23 98 49.82 100 65-135 1 0-20	1,1,1,2-Tetrachloroethane	ND	50.00	47.91	96	47.87	96	80-130	0	0-20	
Toluene ND 50.00 48.57 97 48.18 96 75-120 1 0-20 1,2,4-Trichlorobenzene ND 50.00 49.23 98 49.82 100 65-135 1 0-20	1,1,2,2-Tetrachloroethane	ND	50.00	52.31	105	53.33	107	65-130	2	0-20	
1,2,4-Trichlorobenzene ND 50.00 49.23 98 49.82 100 65-135 1 0-20	Tetrachloroethene	ND	50.00	44.59	89	43.31	87	45-150	3	0-20	
	Toluene	ND	50.00	48.57	97	48.18	96	75-120	1	0-20	
1,1,1-Trichloroethane ND 50.00 45.95 92 46.57 93 65-130 1 0-20	1,2,4-Trichlorobenzene	ND	50.00	49.23	98	49.82	100	65-135	1	0-20	
	1,1,1-Trichloroethane	ND	50.00	45.95	92	46.57	93	65-130	1	0-20	



Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.

Date Received:

Work Order:

14-07-1550

Kailua, HI 96734-2500

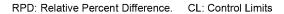
Preparation:

Method:

GC/MS / EPA 8260B

Project: Red Hill LTM 112066 Page 4 of 4

<u>Parameter</u>	<u>Sample</u> <u>Conc.</u>	<u>Spike</u> Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Hexachloro-1,3-Butadiene	ND	50.00	46.15	92	46.43	93	50-140	1	0-20	
1,1,2-Trichloroethane	ND	50.00	50.04	100	49.56	99	75-125	1	0-20	
Trichloroethene	ND	50.00	48.06	96	47.51	95	70-125	1	0-20	
1,2,3-Trichloropropane	ND	50.00	47.27	95	47.63	95	75-125	1	0-20	
Vinyl Chloride	ND	50.00	45.23	90	44.53	89	50-145	2	0-20	
p/m-Xylene	ND	100.0	98.81	99	97.46	97	75-130	1	0-20	
o-Xylene	ND	50.00	51.41	103	51.11	102	80-120	1	0-20	
Methyl-t-Butyl Ether (MTBE)	ND	50.00	45.34	91	46.70	93	65-125	3	0-20	



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Quality Control - PDS

Environmental Science International, Inc.

Date Received:

Work Order:

14-07-1550

Kailua, HI 96734-2500

Preparation:

Method:

Date Received:

07/23/14

Work Order:

14-07-1550

EPA 3005A Filt.

Method:

EPA 6020

Project: Red Hill LTM 112066 Page 1 of 1

Quality Control Sample ID	Туре	N	Matrix	Instrument	Date Prepared [PDS/PDSD Batch Number	
14-07-1466-2	Sample	Д	Aqueous	ICP/MS 04	07/23/14 00:00 0	7/24/14 19:48	140723S03	
14-07-1466-2	PDS	Д	vqueous	ICP/MS 04	07/23/14 00:00 ()7/24/14 19:43	140723S03	
Parameter		Sample Conc.	Spike Added	PDS Conc	. PDS %Rec	. %Rec. C	<u>Qualifiers</u>	
Lead		ND	100.0	102.3	102	75-125		





Quality Control - LCS/LCSD

 Environmental Science International, Inc.
 Date Received:
 07/23/14

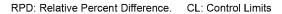
 354 Uluniu Street, Suite 304
 Work Order:
 14-07-1550

 Kailua, HI 96734-2500
 Preparation:
 EPA 3510C

 Method:
 EPA 8015B (M)

 Project: Red Hill LTM 112066
 Page 1 of 5

Quality Control Sample ID	Туре	Mat	rix	Instrument	Date Prepar	ed Date	Analyzed	LCS/LCSD Ba	atch Number
099-15-516-159	LCS	Aqı	ieous	GC 45	07/24/14	07/2	5/14 03:49	140724B11B	
099-15-516-159	LCSD	Aqı	ieous	GC 45	07/24/14	07/2	6/14 04:08	140724B11B	
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD % %Rec.	Rec. CL	RPD	RPD CL	Qualifiers
TPH as Diesel	2000	2008	100	2003	100 60	0-132	0	0-11	





Quality Control - LCS

Environmental Science International, Inc.

Date Received:

Work Order:

14-07-1550

Kailua, HI 96734-2500

Date Received:

Preparation:

Date Received:

14-07-1550

EPA 3005A Filt.

Method: EPA 6020

Project: Red Hill LTM 112066 Page 2 of 5

Quality Control Sample ID	Туре	Matrix	Instrument D	ate Prepared	Date Analyzed LCS Ba	atch Number
099-14-497-87	LCS	Aqueous	ICP/MS 04 0	7/23/14	07/24/14 19:32 140723	BL03D
<u>Parameter</u>		Spike Added	Conc. Recovered	d LCS %Red	. %Rec. CL	<u>Qualifiers</u>
Lead		100.0	91.75	92	80-120	





Quality Control - LCS

Environmental Science International, Inc.

354 Uluniu Street, Suite 304 Kailua, HI 96734-2500

Project: Red Hill LTM 112066

Benzo (g,h,i) Perylene

Date Received:

07/23/14 14-07-1550

Work Order: Preparation:

EPA 3510C

Method:

EPA 8270C SIM PAHs

Page 3 of 5

0 11 0 1 10						1.00 5.11.11
Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared		LCS Batch Number
099-15-148-52	LCS	Aqueous	GC/MS AAA	07/28/14	07/29/14 13:28	
<u>Parameter</u>		Spike Added	Conc. Recove	ered LCS %Re	ec. %Rec.	CL Qualifiers
Naphthalene		2.000	1.361	68	21-133	
2-Methylnaphthalene		2.000	1.230	61	21-140	
1-Methylnaphthalene		2.000	1.226	61	20-140	
Acenaphthylene		2.000	1.167	58	33-145	
Acenaphthene		2.000	1.271	64	55-121	
Fluorene		2.000	1.315	66	59-121	
Phenanthrene		2.000	1.379	69	54-120	
Anthracene		2.000	1.393	70	27-133	
Fluoranthene		2.000	1.385	69	26-137	
Pyrene		2.000	1.333	67	45-129	
Benzo (a) Anthracene		2.000	1.343	67	33-143	
Chrysene		2.000	1.447	72	17-168	
Benzo (k) Fluoranthene		2.000	1.265	63	24-159	
Benzo (b) Fluoranthene		2.000	1.294	65	24-159	
Benzo (a) Pyrene		2.000	1.273	64	17-163	
ndeno (1,2,3-c,d) Pyrene		2.000	1.408	70	25-175	
Dibenz (a,h) Anthracene		2.000	1.350	67	25-175	

1.500

75

25-157

2.000



Quality Control - LCS/LCSD

Environmental Science International, Inc. 354 Uluniu Street, Suite 304

Kailua, HI 96734-2500

Date Received:

07/23/14 14-07-1550

Work Order: Preparation:

EPA 5030C

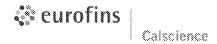
Method:

GC/MS / EPA 8260B

Page 4 of 5

Project: Red Hill LTM 112066	Project:	Red	Hill	LTM	112066
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Quality Control Sample ID 099-13-057-58	Type LCS	Ma	trix ueous	Instrument GC/MS OO	Date Pre	•		LCS/LCSD Ba	atch Number
099-13-057-58	LCSD			GC/MS OO	07/23/14			140723L017	
Parameter		LCS Conc.	ueous LCS	LCSD Conc.	LCSD	%Rec. CL	RPD	RPD CL	Qualifiers
<u>r arameter</u>	Opike Added	LCO CONC.	<u>%Rec.</u>	ECOD CONC.	<u>%Rec.</u>	7011CC. OL	IXI D	INI D OL	Qualifiers
Acetone	50.00	76.54	153	N/A	N/A	40-140	N/A	0-20	Χ
Benzene	50.00	48.59	97	N/A	N/A	80-120	N/A	0-20	
Bromodichloromethane	50.00	50.08	100	N/A	N/A	75-120	N/A	0-20	
Bromoform	50.00	50.09	100	N/A	N/A	70-130	N/A	0-20	
Bromomethane	50.00	46.74	93	N/A	N/A	30-145	N/A	0-20	
2-Butanone	50.00	56.87	114	N/A	N/A	30-150	N/A	0-20	
Carbon Tetrachloride	50.00	46.09	92	N/A	N/A	65-140	N/A	0-20	
Chlorobenzene	50.00	51.12	102	N/A	N/A	80-120	N/A	0-20	
Chloroethane	50.00	44.84	90	N/A	N/A	60-135	N/A	0-20	
Chloroform	50.00	48.48	97	N/A	N/A	65-135	N/A	0-20	
Chloromethane	50.00	41.19	82	N/A	N/A	40-125	N/A	0-20	
Dibromochloromethane	50.00	52.03	104	N/A	N/A	60-135	N/A	0-20	
1,2-Dibromo-3-Chloropropane	50.00	45.40	91	N/A	N/A	50-130	N/A	0-20	
1,2-Dibromoethane	50.00	48.92	98	N/A	N/A	80-120	N/A	0-20	
1,2-Dichlorobenzene	50.00	51.03	102	N/A	N/A	70-120	N/A	0-20	
1,3-Dichlorobenzene	50.00	51.52	103	N/A	N/A	75-125	N/A	0-20	
1,4-Dichlorobenzene	50.00	48.28	97	N/A	N/A	75-125	N/A	0-20	
1,1-Dichloroethane	50.00	47.01	94	N/A	N/A	70-135	N/A	0-20	
1,2-Dichloroethane	50.00	46.72	93	N/A	N/A	70-130	N/A	0-20	
1,1-Dichloroethene	50.00	47.70	95	N/A	N/A	70-130	N/A	0-20	
c-1,2-Dichloroethene	50.00	53.05	106	N/A	N/A	70-125	N/A	0-20	
t-1,2-Dichloroethene	50.00	51.14	102	N/A	N/A	60-140	N/A	0-20	
1,2-Dichloropropane	50.00	49.85	100	N/A	N/A	75-125	N/A	0-20	
c-1,3-Dichloropropene	50.00	52.80	106	N/A	N/A	70-130	N/A	0-20	
t-1,3-Dichloropropene	50.00	51.91	104	N/A	N/A	55-140	N/A	0-20	
Ethylbenzene	50.00	49.38	99	N/A	N/A	75-125	N/A	0-20	
Methylene Chloride	50.00	51.00	102	N/A	N/A	55-140	N/A	0-20	
4-Methyl-2-Pentanone	50.00	50.30	101	N/A	N/A	60-135	N/A	0-20	
Styrene	50.00	51.16	102	N/A	N/A	65-135	N/A	0-20	
1,1,1,2-Tetrachloroethane	50.00	48.31	97	N/A	N/A	80-130	N/A	0-20	
1,1,2,2-Tetrachloroethane	50.00	50.35	101	N/A	N/A	65-130	N/A	0-20	
Tetrachloroethene	50.00	49.33	99	N/A	N/A	45-150	N/A	0-20	
Toluene	50.00	48.73	97	N/A	N/A	75-120	N/A	0-20	
1,2,4-Trichlorobenzene	50.00	49.14	98	N/A	N/A	65-135	N/A	0-20	
1,1,1-Trichloroethane	50.00	46.95	94	N/A	N/A	65-130	N/A	0-20	
Hexachloro-1,3-Butadiene	50.00	46.63	93	N/A	N/A	50-140	N/A	0-20	



Quality Control - LCS/LCSD

Environmental Science International, Inc.

Date Received:

Work Order:

14-07-1550

Kailua, HI 96734-2500

Preparation:

Method:

GC/MS / EPA 8260B

Project: Red Hill LTM 112066 Page 5 of 5

<u>Parameter</u>	Spike Added	LCS Conc.	<u>LCS</u> %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	<u>Qualifiers</u>
1,1,2-Trichloroethane	50.00	50.31	101	N/A	N/A	75-125	N/A	0-20	
Trichloroethene	50.00	49.97	100	N/A	N/A	70-125	N/A	0-20	
1,2,3-Trichloropropane	50.00	48.66	97	N/A	N/A	75-125	N/A	0-20	
Vinyl Chloride	50.00	45.04	90	N/A	N/A	50-145	N/A	0-20	
p/m-Xylene	100.0	98.26	98	N/A	N/A	75-130	N/A	0-20	
o-Xylene	50.00	51.86	104	N/A	N/A	80-120	N/A	0-20	
Methyl-t-Butyl Ether (MTBE)	50.00	47.49	95	N/A	N/A	65-125	N/A	0-20	
Gasoline Range Organics	1000	1017	102	1007	101	80-120	1	0-20	





Sample Analysis Summary Report

Work Order: 14-07-1550				Page 1 of 1
Method	Extraction	Chemist ID	Instrument	Analytical Location
EPA 6020	EPA 3005A Filt.	598	ICP/MS 04	1
EPA 8015B (M)	EPA 3510C	628	GC 45	1
EPA 8270C SIM PAHs	EPA 3510C	923	GC/MS AAA	1
GC/MS / EPA 8260B	EPA 5030C	849	GC/MS OO	2

Location 1: 7440 Lincoln Way, Garden Grove, CA 92841 Location 2: 7445 Lampson Avenue, Garden Grove, CA 92841



Glossary of Terms and Qualifiers

Work Order: 14-07-1550 Page 1 of 1

Qualifiers	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
В	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
DL	The Detection Limit (DL) is the smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
ICH	Initial calibration verification recovery is above the control limit for this analyte.
ICJ	Initial calibration verification recovery is below the control limit for this analyte.
IH	Calibration verification recovery is above the control limit for this analyte.
IJ	Calibration verification recovery is below the control limit for this analyte.
J	Analyte was detected at a concentration below the LOQ and above the DL. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
LOD	The Limit of Detection (LOD) is the smallest amount or concentration of a substance that must be present in a sample in order to be detected at 99% confidence level.
LOQ	The Limit of Quantitation (LOQ) is the lowest concentration of a substance that produces a quantitative result within specified limits of precision and bias.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
U	Undetected at Detection Limit (DL) and is reported as less than the Limit of Detection (LOD).
Χ	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All OC results are

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

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From:

Ann Dang [ADang@esciencei.com] Tuesday, July 22, 2014 6:34 PM Richard Villafania

Sent: To:

Cc:

Domonkos Feher; Traci Sylva; Jeff Hattemer

Subject:

112066 Red Hill shipment 7-22-14

Attachments:

Richard Villafania

COC 7-22-14.pdf

Hi Richard,

We shipped 2 coolers today, the FedEx tracking is 804557917397 and 780047104871.

For ES107UF, "field filtered" should not be marked. The correction was made on the attached COC.

Thanks, Ann

Click here to report this email as spam.



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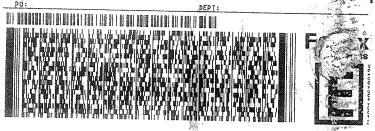
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TO SAMPLE CONTROL CAL SCIENCE 7440 LINCOLN WAY

GARDEN GROVE CA 92841

714) 895-5494

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ORIGIN ID:HNLA (808) 261-0740 ESI

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Calscience

WORK ORDER #: 14-07- ☐ 5 5 0

SAMPLE RECEIPT FORM

Cooler 1 of 2

CLIENT: Fny Science.	DATE:	07/23	/14				
TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)							
Temperature	Blank	☐ Sampl	le				
☐ Sample(s) outside temperature criteria (PM/APM contacted by:)							
☐ Sample(s) outside temperature criteria but received on ice/chilled on same d	av of samp	lina.					
☐ Received at ambient temperature, placed on ice for transport by Co		.					
Ambient Temperature: Air Filter		Checked l	ov: 15				
Ambient remperature.							
CUSTODY SEALS INTACT:			, 4				
☑ Cooler ☐ ☐ No (Not Intact) ☐ Not Present	□ N/A	Checked b	y: <u>15</u>				
Sample □ No (Not Intact) □ Not Present		Checked b	y: <u>826</u>				
	Yes	No	N/A				
		TNO					
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COC document(s) received complete			harmel				
 □ Collection date/time, matrix, and/or # of containers logged in based on sample labels. □ No analysis requested. □ Not relinquished. □ No date/time relinquished. 							
Sampler's name indicated on COC							
Sample container label(s) consistent with COC							
Sample container(s) intact and good condition							
Proper containers and sufficient volume for analyses requested	,						
Analyses received within holding time			. [7]				
Analyses received within 15-minute holding time	9	beginner					
□ pH □ Residual Chlorine □ Dissolved Sulfides □ Dissolved Oxygen	. 🗆						
Proper preservation noted on COC or sample container							
Unpreserved vials received for Volatiles analysis							
Volatile analysis container(s) free of headspace							
Tedlar bag(s) free of condensation							
CONTAINER TYPE:							
Solid: □4ozCGJ □8ozCGJ □16ozCGJ □Sleeve () □EnCore	s [®] □Terra	a $Cores^{\otimes}$ \square					
Aqueous: ZVOA ZVOAh DVOAna₂ D125AGB D125AGBh D125AGBp	Z1AGB	□1AGEna₂	□1AGB s				
□500AGB Ø500AGJ □500AGJs □250AGB □250CGB □250CGBs	s □1PB	□1PBna [□500PB				
□250PB ☑250PBnu□125PB □125PBznna □100PJ □100PJna ₂ □							
Air: □Tedlar [®] □Canister Other: □ Trip Blank Lot #: <u>)3 0 </u>	_ Labeled	d/Checked by	y: 836				
Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Er	nvelope	Reviewed by	/: <u>//"U</u>				



Calscience

WORK ORDER #: 14-07- 4 5 5 0

SAMPLE RECEIPT FORM

Cooler <u>L</u> of <u>2</u>

CLIENT: Env. Science. DATE: 07/23/14							
TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)							
Temperature 2 • ℃ °C - 0.3°C (CF) = 2 • 5 °C							
☐ Sample(s) outside temperature criteria (PM/APM contacted by:)							
☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.							
☐ Received at ambient temperature, placed on ice for transport by Courier.							
Ambient Temperature: Air Filter Checked by: 15							
CUSTODY SEALS INTACT:							
Soler □ □ No (Not Intact) □ Not Present □ N/A Checked by: 15							
☑ Sample □ □ No (Not Intact) □ Not Present Checked by: _ 8//_							
SAMPLE CONDITION: Yes No N/A							
Chain-Of-Custody (COC) document(s) received with samples							
COC document(s) received complete							
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.							
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.							
Sampler's name indicated on COC							
Sample container label(s) consistent with COC							
Sample container(s) intact and good condition							
Proper containers and sufficient volume for analyses requested							
Analyses received within holding time							
Aqueous samples received within 15-minute holding time							
□ pH □ Residual Chlorine □ Dissolved Sulfides □ Dissolved Oxygen □ □ □							
Proper preservation noted on COC or sample container							
Unpreserved vials received for Volatiles analysis							
Volatile analysis container(s) free of headspace □ □ □							
Tedlar bag(s) free of condensation							
Solid: □4ozCGJ □8ozCGJ □16ozCGJ □Sleeve () □EnCores® □ŢerraCores® □							
Aqueous: ØVOA □VOAh □VOAna₂ □125AGB □125AGBh □125AGBp_Ø1AGB □1AGBna₂ □1AGBs							
□500AGB Ø500AGJ □500AGJs □250AGB □250CGB □250CGBs □1PB □1PBna □500PB							
□250PB №250PBn;;□125PB □125PBznna □100PJ □100PJna ₂ □ □ □ □							
Air: Tedlar® Canister Other: Trip Blank Lot#: Labeled/Checked by: 806 Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: 776							

RAW DATA SHEET FOR METHOD: EPA 8015B (M)

WORK ORDER: **INSTRUMENT:**

14-07-1550

GC 45

EXTRACTION:

EPA 3510C

140724B11B

D/T EXTRACTED:

2014-07-24 00:00

ANALYZED BY:

628

D/T ANALYZED: **REVIEWED BY:** D/T REVIEWED: 2014-07-25 09:09

DATA FILE:

W:\GC 45\GC 45 DATA\2014\140724\14072455.D\14072455

#

CLIENT SAMPLE NUMBER: ES106

LCS/MB BATCH:

MS/MSD BATCH:

ug/L

SAMPLE VOLUME / WEIGHT:

FINAL VOLUME / WEIGHT: ADJUSTMENT RATIO TO PF: DEFAULT: 500.00 ml / ACTUAL: 500.00 ml

DEFAULT: 5.00 ml / ACTUAL: 2.50 ml

0.50

COMMENT:

UNITS:

Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are

.

ر ق

qualified with a "J" flag. TPH as Diesel is quantified in the carbon range C10-C28.

INI. CONC

DF

CONC

4 5.D\

DL.

LOD

LOQ

QUAL

COMPOUND TPH as Diesel 7390

1.00

。 图 **建铁** "10

37.0

11

12

25

b

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072455.D

Vial Number : Vial 55

Page Number : 1
Operator : 682 Vial Number : Vial Instrument : GC 45 Injection Number : 1
Sample Name : 14-07-1550-1 Sequence Line : 55

Instrument Method: C:\CHEM32\1\METHODS\ ->

Acquired on : 25 Jul 14 9:09:52 AM

Report Created on: 25 Jul 14 06:12 pm Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies

Sig.	1	in	W:\GC_	_45\GC	45	DATA\	(2014)	\140724\	->

g. 1 Pk	<pre>in W:\GC_45\GC Ret Time</pre>	45 DATA\2014 Area	\140724\ Height	-> Peak	Width	Response %
1	_					-
1	3.471	0.27	•	0 VV	0.025	0.029
2	3.496	0.27		0 .VV	0.024	0.029
3	3.541	0.98		0 VV	0.046	0.107
4	3.614	1.57		1 VV	0.030	0.171
5	3.658	0.52		0 · VV	0.024	0.056
6	3.686	0.50		o vv	0.023	0.055
7	3.730	1.30	•	1 VV	0.040	0.141
8	3.804	2.38		1 VV	0.043	0.259
9	3.840	1.42		1 VV	0.041	0.155
10	3.896	1.97		1 VV	0.034	0.214
11	3.916	1.57		1 VV	0.031	0.170
12	3.984	4.47		1 VV	0.050	0.486
13	4.060	6.75	1	3 . VV	0.037	0.734
14	4.127	4.63		1 VV .	0.053	0.504
15	4.166	4.30	A _p r	2 VV	0.042	0.468
16	4.226	5.53		2 VV ,	0.051	0.602
17	4.285	7.70		2 VV '	0.061	0.837
18	4.327	1.85		2 VV	0.015	0.201
19	4.393	8.42	•	2 VV	0.062	0.916
20	4.413	2.78		2 VV	0.020	0.303
21	4.430	10.16		3 VV	0.054	1.105
22	4.489	3.55		2 VV	0.026	0.386
23	4.511	5.51		2 VV	0.040	0.599
24		9.84		2 VV	0.072	1.070
25		4.25		2 VV	0.032	0.462
26		3.64	-	2 VV	0.028	0.396
27		23.63		6 VV	0.068	2.570
28		2.64		2 VV.	0.024	0.287
29		2.76		2 VV	0.025	0.301
30		4.16		2 VV	0.039	0.452
31		4.46		2 VV	0.044	0.485
32		1.55		1 VV	0.019	0.168
33		3,42		1 VV	0.041	0.372
34		2.97			0.038	0.323
35		5.93	+ N +		0.054	0.645
36		2.76		1 VV	0.054	0.300
37		3.08			0.038	0.335
38		1.92	7.	1 VV	0.048	0.209
39	5.378	763.94		549 VV	0.023	83.096

Total area = 919.34

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072455.D

Page Number : 2

Operator : 682

: 002

2 Vial Number

Instrument : GC 45
Sample Name : 14-07-1550-1

Vial Number : Vial 55 Injection Number : 1

Sequence Line : 55

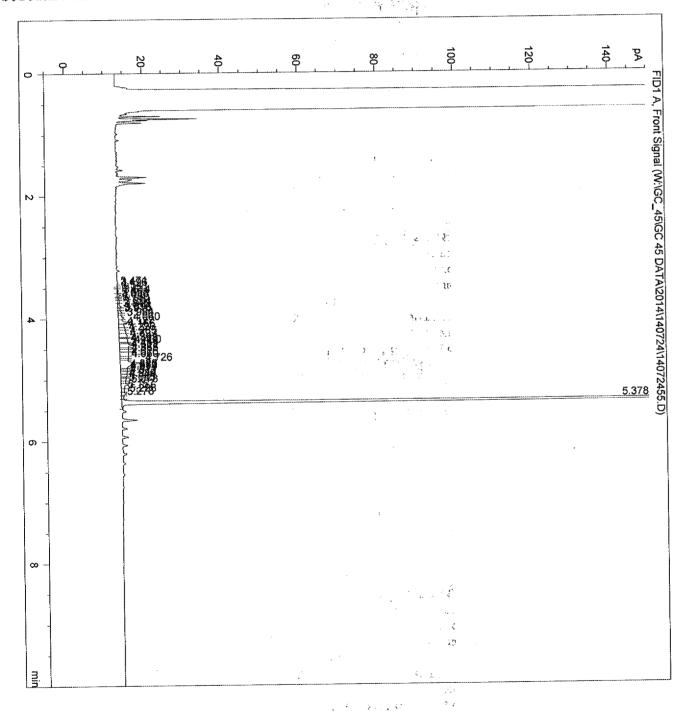
Instrument Method: C:\CHEM32\1\METHODS\

Acquired on : 25 Jul 14 9:09:52 AM

Report Created on: 25 Jul 14 06:12 pm

Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies



RAW DATA SHEET FOR METHOD: EPA 8015B (M)

WORK ORDER:

14-07-1550

INSTRUMENT:

GC 45

EXTRACTION: D/T EXTRACTED:

2014-07-24 00:00

EPA 3510C

ANALYZED BY:

628 D/T ANALYZED:

2014-07-25 09:28

REVIEWED BY:

D/T REVIEWED:

DATA FILE:

W:\GC 45\GC 45 DATA\2014\140724\14072456.D\14072456

2

CLIENT SAMPLE NUMBER: ES107

LCS/MB BATCH:

MS/MSD BATCH:

140724B11B

ug/L

SAMPLE VOLUME / WEIGHT:

DEFAULT: 500.00 ml / ACTUAL: 500.00 ml

DEFAULT: 5.00 ml / ACTUAL: 2.50 ml

FINAL VOLUME / WEIGHT: ADJUSTMENT RATIO TO PF

0.50

UNITS:

Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are

qualified with a "J" flag. TPH as Diesel is quantified in the carbon range C10-C28.

COMPOUND

COMMENT:

INI. CONC

DF 1.00 CONC

4.1 11

- 201

<u>DL</u> 11

LOD

QUAL LOQ

TPH as Diesel

107

ND

12

25

Page 3 of 4

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072456.D

Page Number : 1

Operator : 682 Vial Number : Vial 56

Instrument : GC 45 Injection Number : 1
Sample Name : 14-07-1550-2 Sequence Line : 56

Instrument Method: C:\CHEM32\1\METHODS\ ->

Acquired on : 25 Jul 14 9:28:40 AM

Report Created on: 25 Jul 14 06:12 pm Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies

Sig. 1 in W:\GC_45\GC 45 DATA\2014\140724\ ->

_	,	Area	Height	Peak	Width	Response %
	_					
	•	2,25			0.019	
2	5.394	771.63	549	VB	0.021	99.710

Total area = 773.87

Area Percent Report

Data File Name : W:\GC 45\GC 45 DATA\2014\140724\14072456.D

Page Number : 2

Operator : 682 Vial

Instrument : GC 45 Sample Name : 14-07-1550-2 Vial Number : Vial 56

Injection Number : 1
Sequence Line : 56

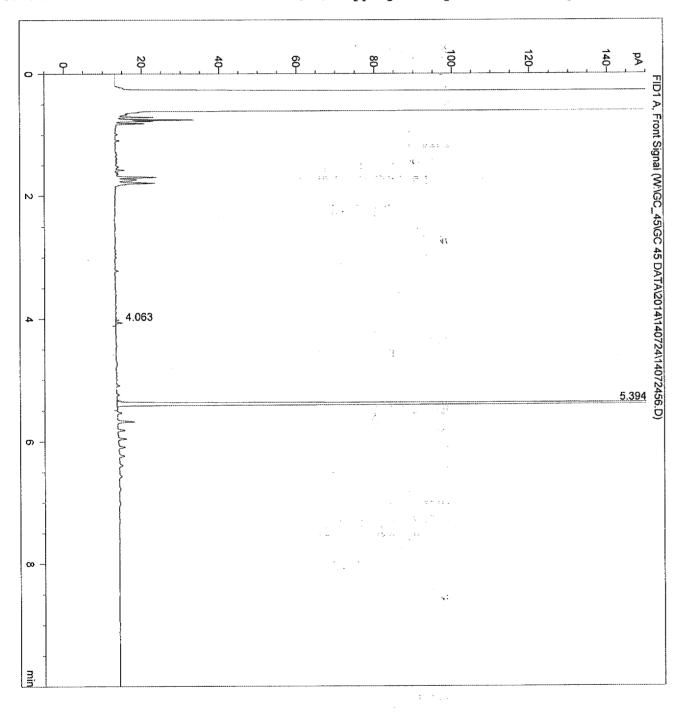
Instrument Method: C:\CHEM32\1\METHODS\

Acquired on : 25 Jul 14 9:28:40 AM

Report Created on: 25 Jul 14 06:12 pm

Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies



RAW DATA SHEET FOR METHOD: EPA 8015B (M)

WORK ORDER:

14-07-1550

INSTRUMENT:

GC 45

EXTRACTION:

EPA 3510C

D/T EXTRACTED:

2014-07-24 00:00

ANALYZED BY:

D/T ANALYZED:

2014-07-25 09:47

628

REVIEWED BY:

D/T REVIEWED:

DATA FILE:

W:\GC 45\GC 45 DATA\2014\140724\14072457.D\14072457

CLIENT SAMPLE NUMBER: ES108

LCS/MB BATCH:

MS/MSD BATCH:

ug/L

140724B11B

SAMPLE VOLUME / WEIGHT:

FINAL VOLUME / WEIGHT:

DEFAULT: 500.00 ml / ACTUAL: 500.00 ml

DEFAULT: 5.00 ml / ACTUAL: 2.50 ml

ADJUSTMENT RATIO TO PE

0.50

COMMENT:

UNITS:

Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are

qualified with a "J" flag. TPH as Diesel is quantified in the carbon range C10-C28.

COMPOUND

INI. CONC

DF

CONC

DL 11

LOD 12

LOQ

TPH as Diesel

270

1.00

ND

6.4

25

QUAL

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072457.D

Page Number : 1

: 682

Vial Number : Vial 57

: GC 45 Instrument

Injection Number: 1

1. Mr

T. W.

.77 V

Sequence Line : 57

: 14-07-1550-3 Sample Name

Instrument Method: C:\CHEM32\1\METHODS\

Operator

Acquired on : 25 Jul 14 9:47:30 AM

Report Created on: 25 Jul 14 06:12 pm

Analysis Method : 8015B.MTH

Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies

Sig. 1 in W:\GC 45\GC 45 DATA\2014\140724\ ->

	Ret Time	Area	Height			Response	
	.						
` 1	4.066	2,43	2	VB	0.020	0.28	9
2	4.741	2.28	1	VV	0.031	0.27	1
3	4.783	0.97	1	VV	0.028	0.11	5
4	5.408	837.46	593	VV	0.022	99.32	5

Total area = 843.14

Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072457.D

Page Number : 2

Operator : 682 Vial Number : Vial 57

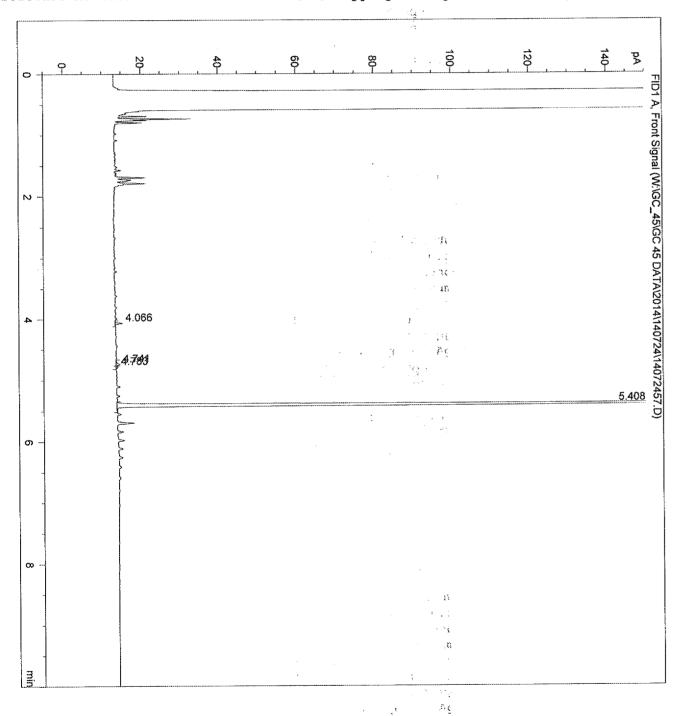
Instrument : GC 45 Injection Number : 1
Sample Name : 14-07-1550-3 Sequence Line : 57

Instrument Method: C:\CHEM32\1\METHODS\ ->

Acquired on : 25 Jul 14 9:47:30 AM

Report Created on: 25 Jul 14 06:12 pm Analysis Method : 8015B.MTH

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Area Percent Report

Data File Name : W:\GC_45\GC 45 DATA\2014\140724\14072436.D

?age Number : 682)perator

Vial Number : Vial 36

[nstrument Sample Name : GC 45

: MB 14072411/12

Injection Number: 1

Sequence Line : 36

Instrument Method: C:\CHEM32\1\METHODS\

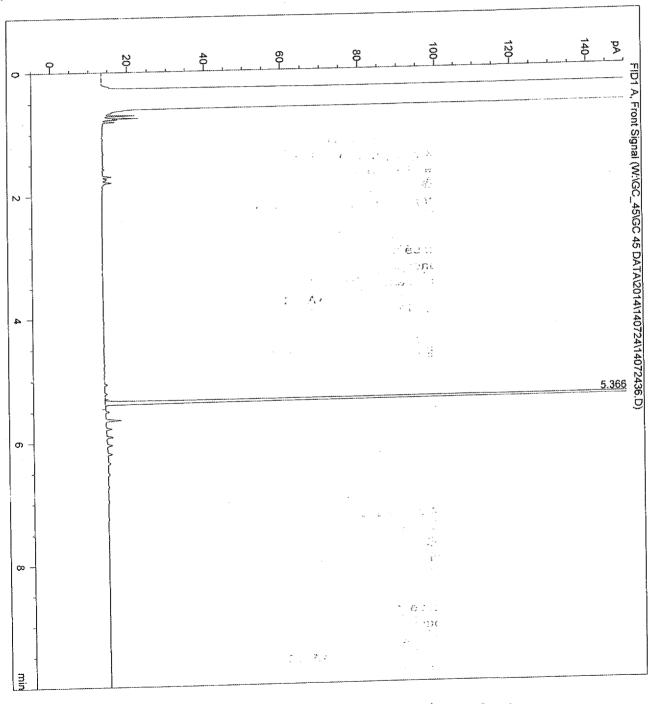
Acquired on

: 25 Jul 14 3:30:24 AM

Report Created on: 25 Jul 14 06:11 pm

Analysis Method : 8015B.MTH

3oftware Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies



Blank

Pata File Name : W:\GC_45\GC 45 DATA\2014\140724\14072434.D

age Number : 682 perator

: Vial 34 Vial Number

: GC 45

Injection Number: 1 Sequence Line : 34

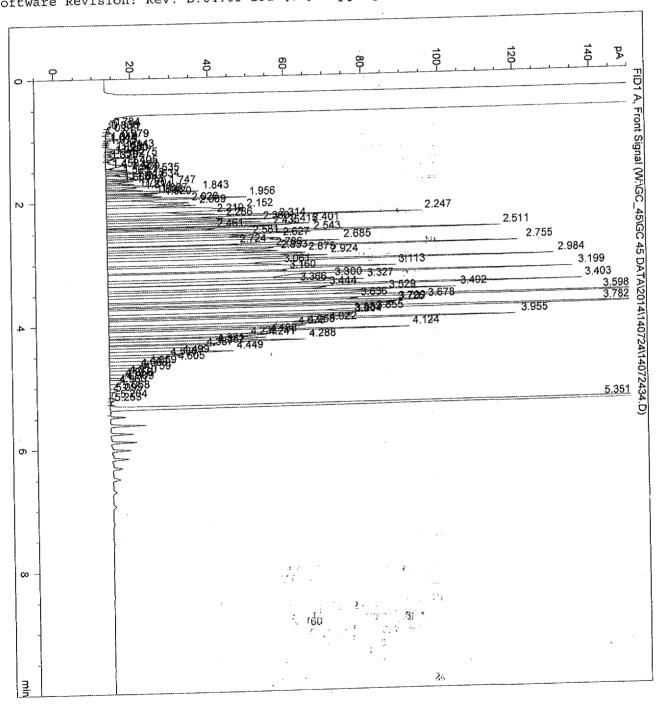
Instrument : D400 C28 50 L041814D Sample Name

Instrument Method: C:\CHEM32\1\METHODS\

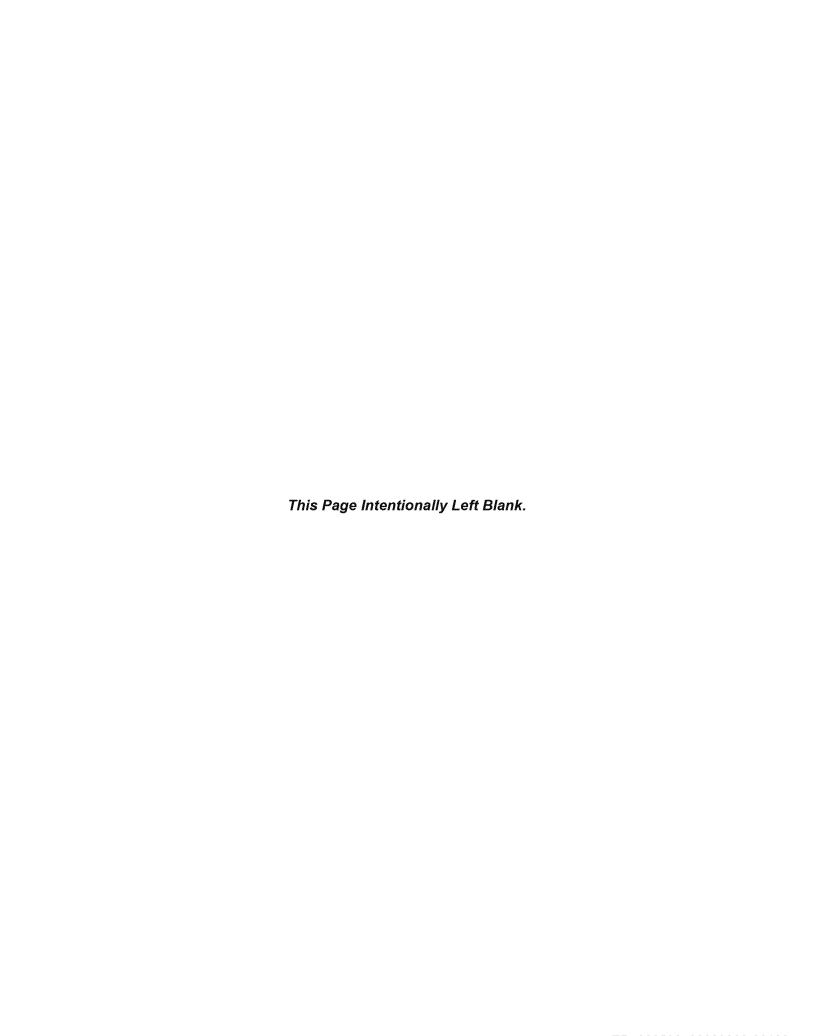
2:53:13 AM : 25 Jul 14 acquired on

Report Created on: 25 Jul 14 06:11 pm Analysis Method : 8015B.MTH

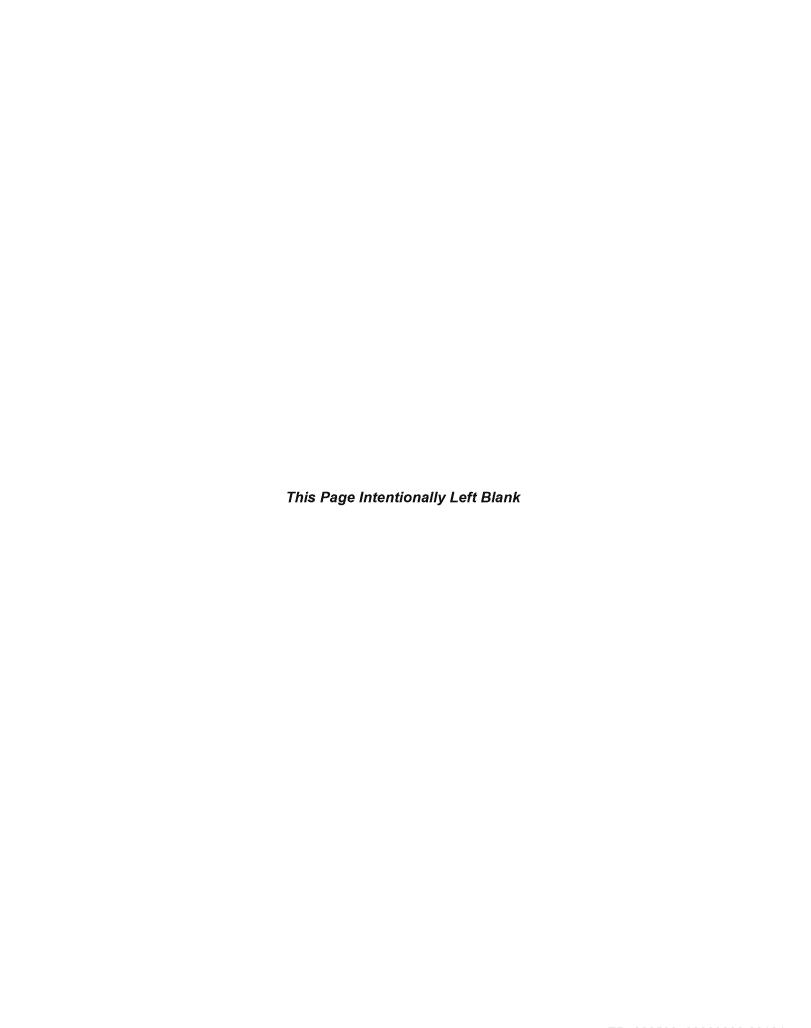
Software Revision: Rev. B.04.03-SP1 [87] Copyright © Agilent Technologies

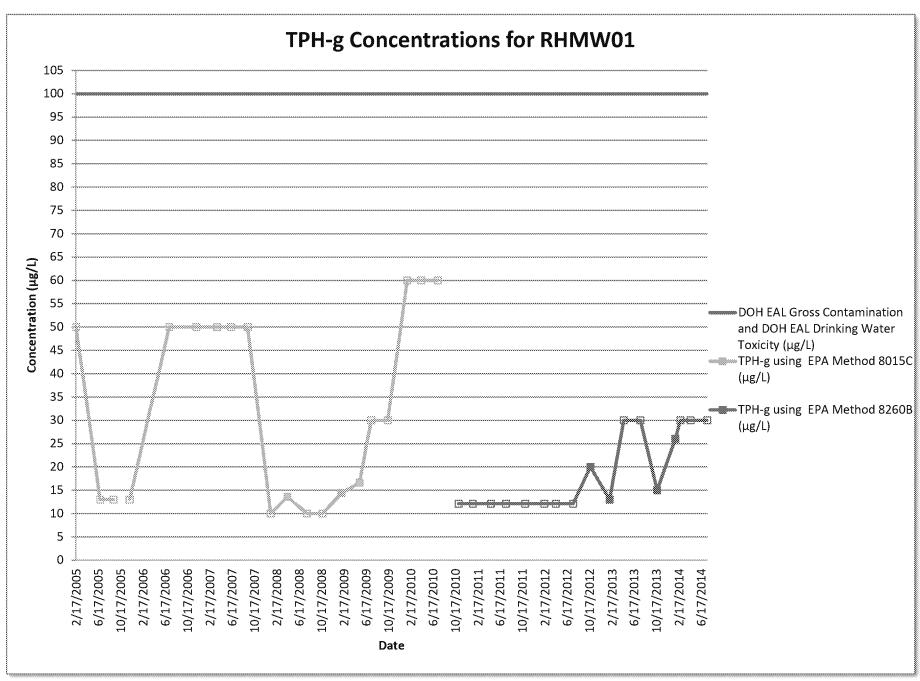


Diesel Standard



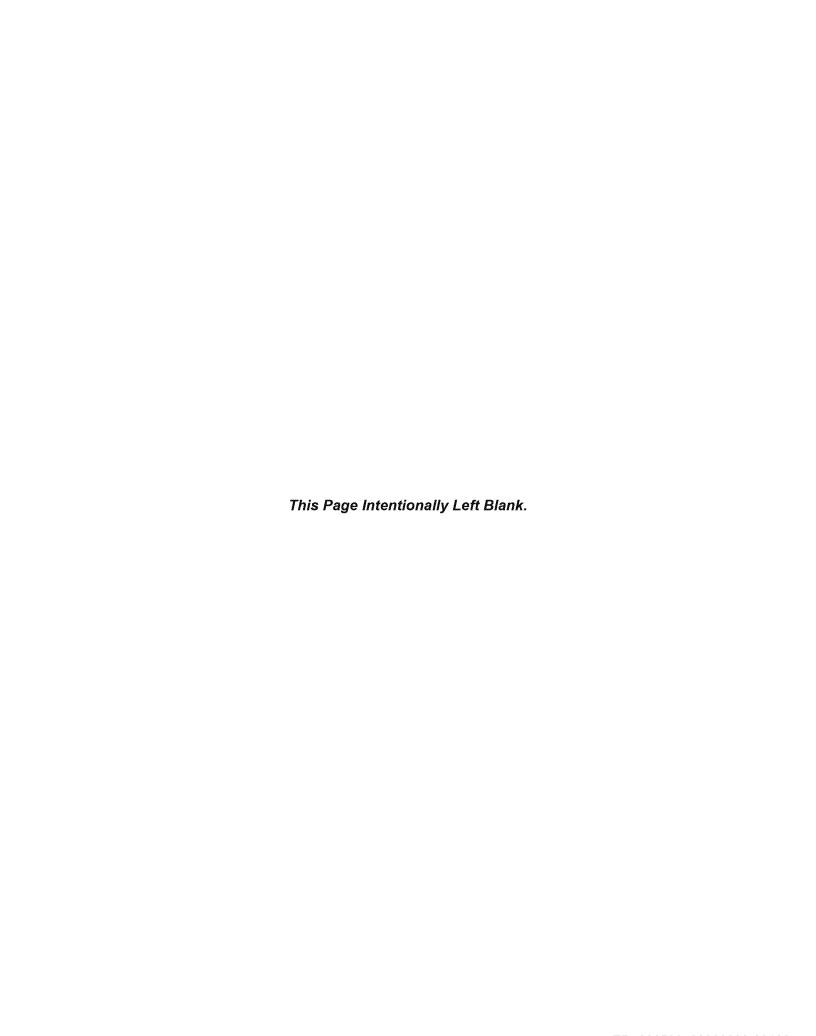
APPENDIX D Historical Groundwater Exceedance Trends

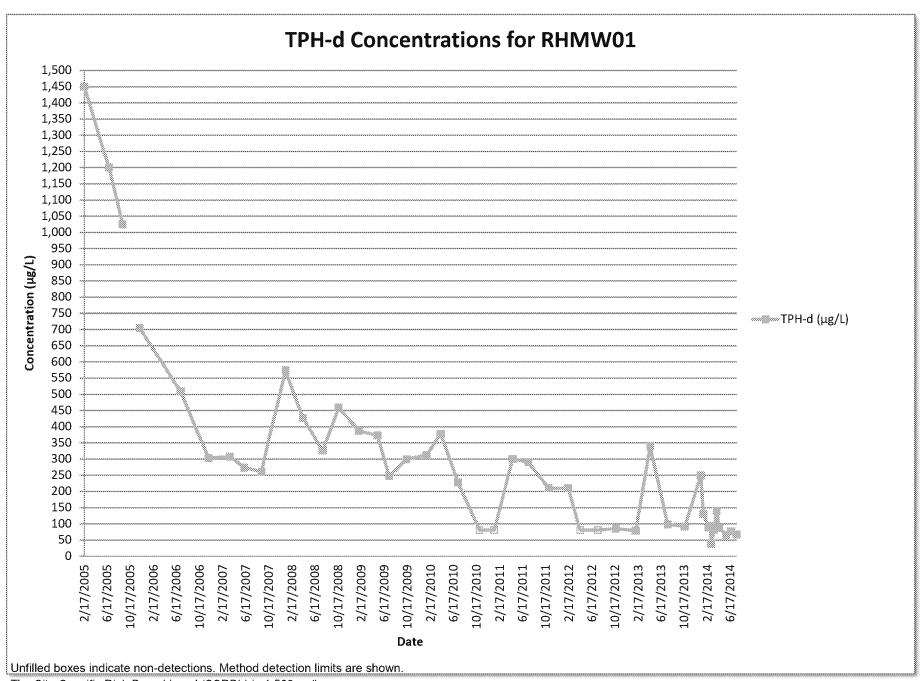




Data points for 2/17/2005 through 9/8/2005 and 12/6/2005 are the average of the primary and duplicate samples. Possible laboratory contamination for 10/22/2012, 10/21/2013, and 1/28/2014 sampling events.

Unfilled boxes indicate non-detections. Method detection limits are shown.

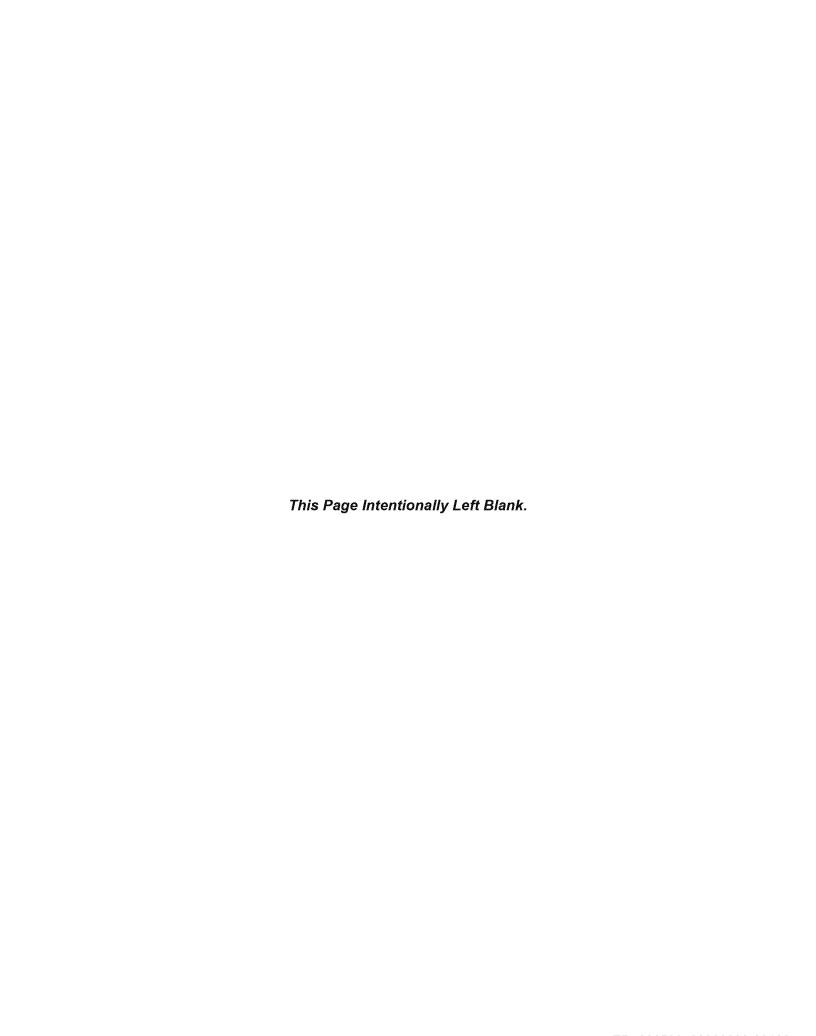


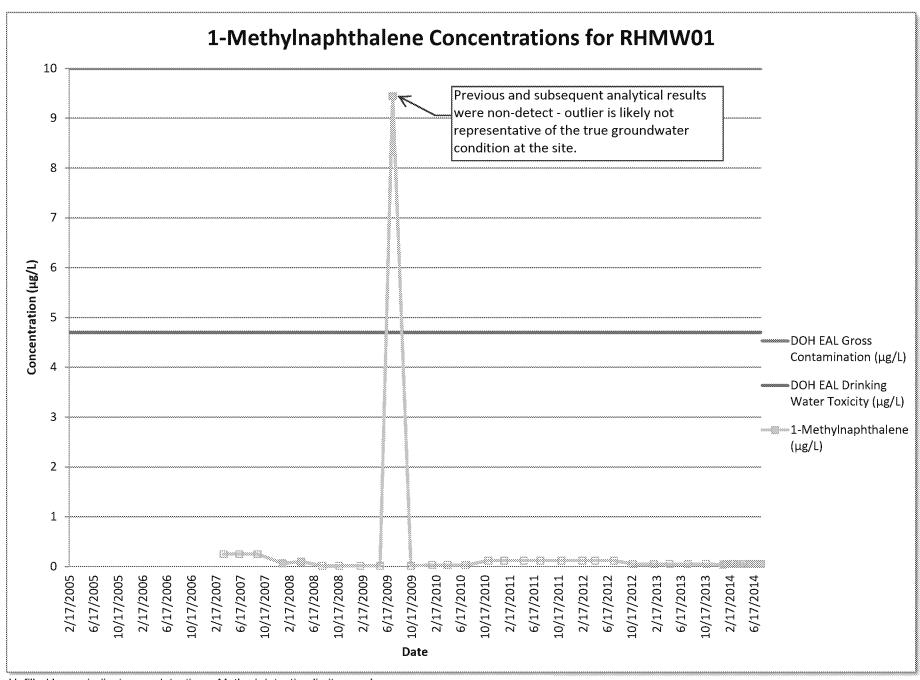


The Site-Specific Risk-Based Level (SSRBL) is 4,500 µg/L.

Numerous sample results had a chromatographic pattern that didn't match the calibration standard. The relatively high TPH-d values may not necessarily be indicative that there is diesel fuel or other petroleum products in the well.

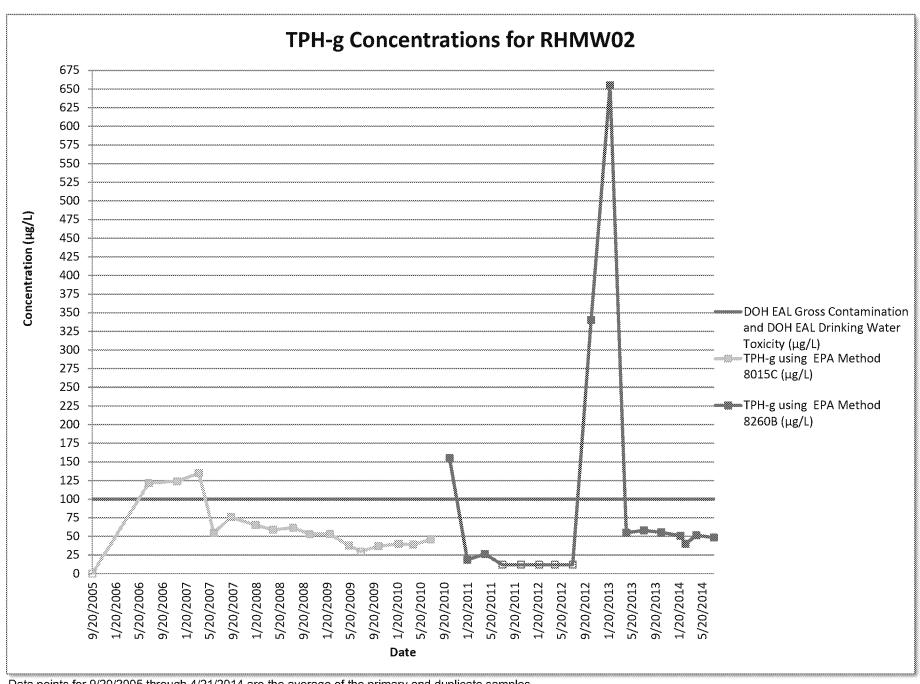
Data points for 2/17/2005 through 9/8/2005 and 12/6/2005 are the average of the primary and duplicate samples.





Unfilled boxes indicate non-detections. Method detection limits are shown.





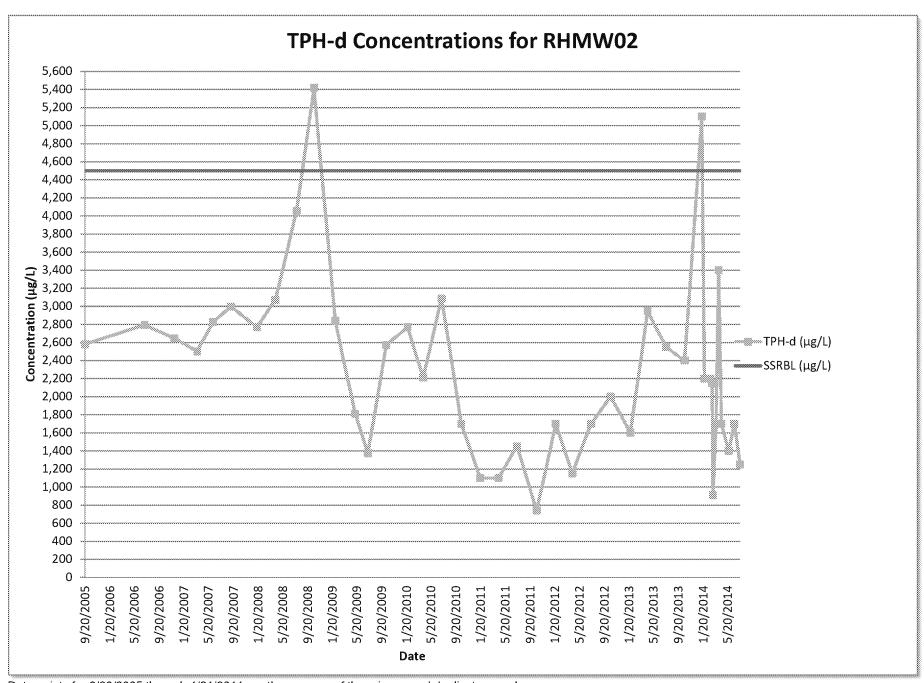
Data points for 9/20/2005 through 4/21/2014 are the average of the primary and duplicate samples.

Possible laboratory contamination for 10/21/2013 and 1/28/2014 sampling events.

Unfilled boxes indicate non-detections. Method detection limits are shown.

Primary sample results are shown for 1/26/2012 and 7/18/2012; all other concentrations are the average of the primary and duplicate sample results.

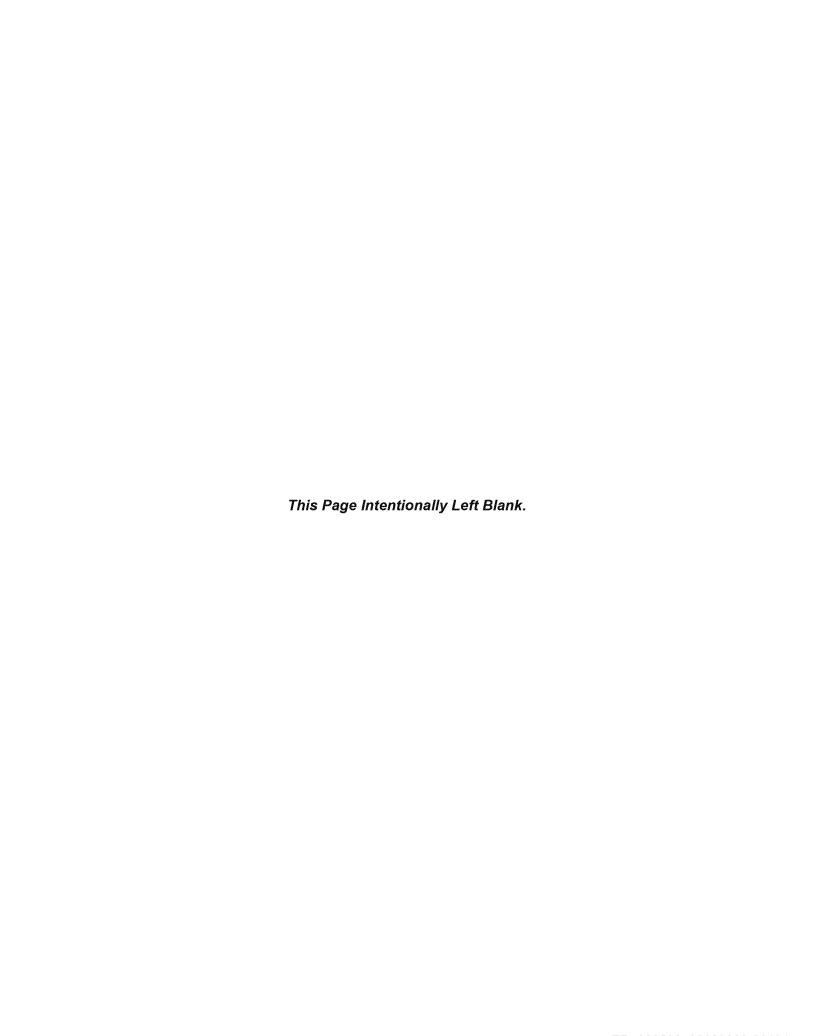


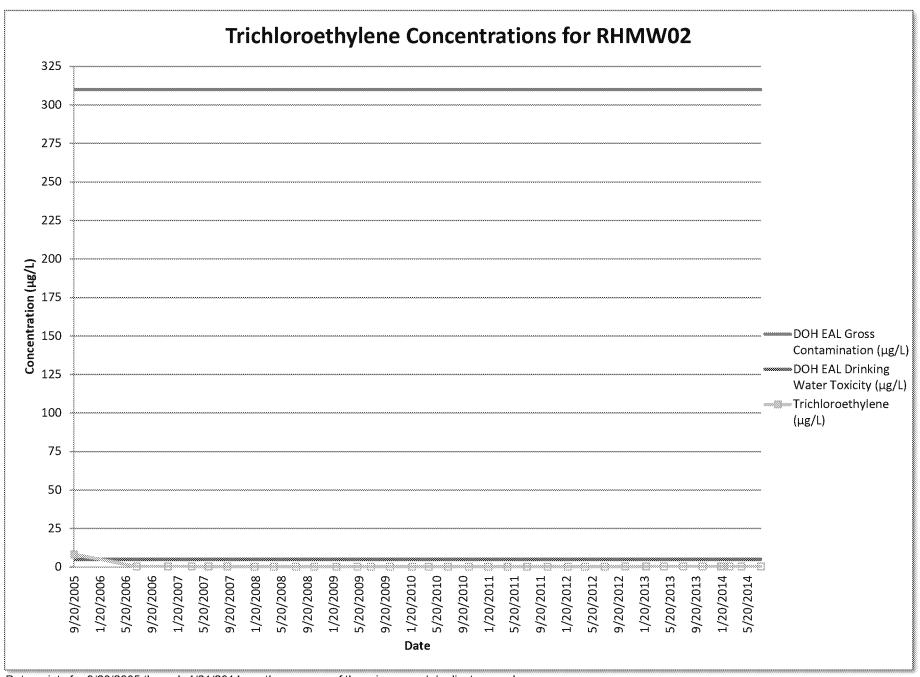


Data points for 9/20/2005 through 4/21/2014 are the average of the primary and duplicate samples.

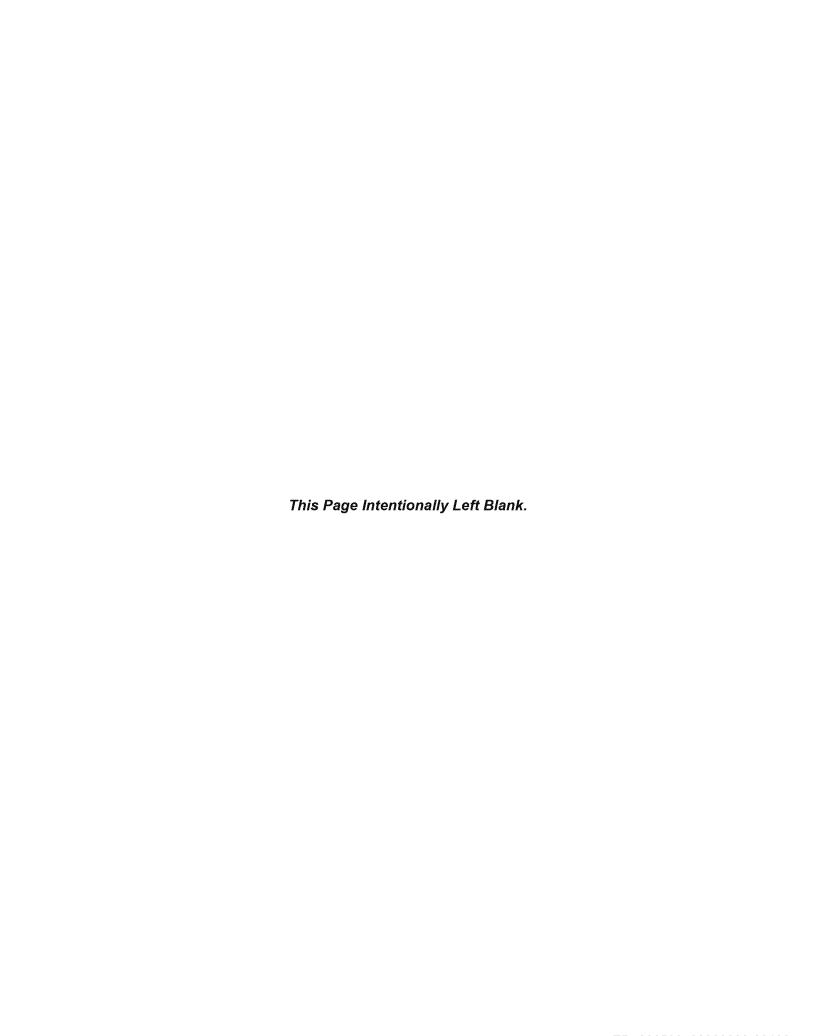
Unfilled boxes indicate non-detections. Method detection limits are shown.

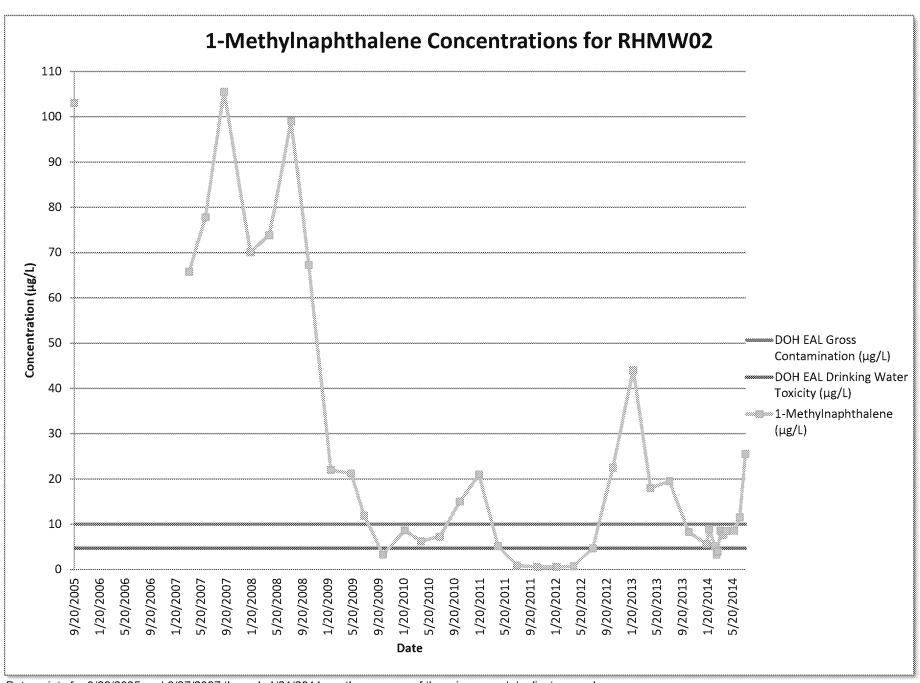
Numerous sample results had a chromatographic pattern that didn't match the calibration standard. The relatively high TPH-d values may not necessarily be indicative that there is diesel fuel or other petroleum products in the well.





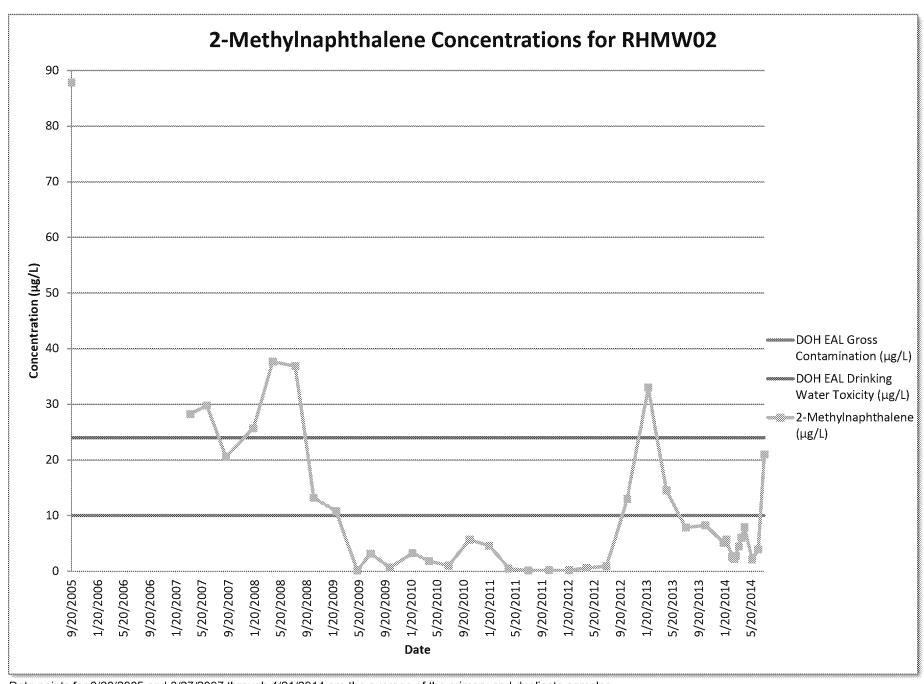
Data points for 9/20/2005 through 4/21/2014 are the average of the primary and duplicate samples. Unfilled boxes indicate non-detections. Method detection limits are shown.



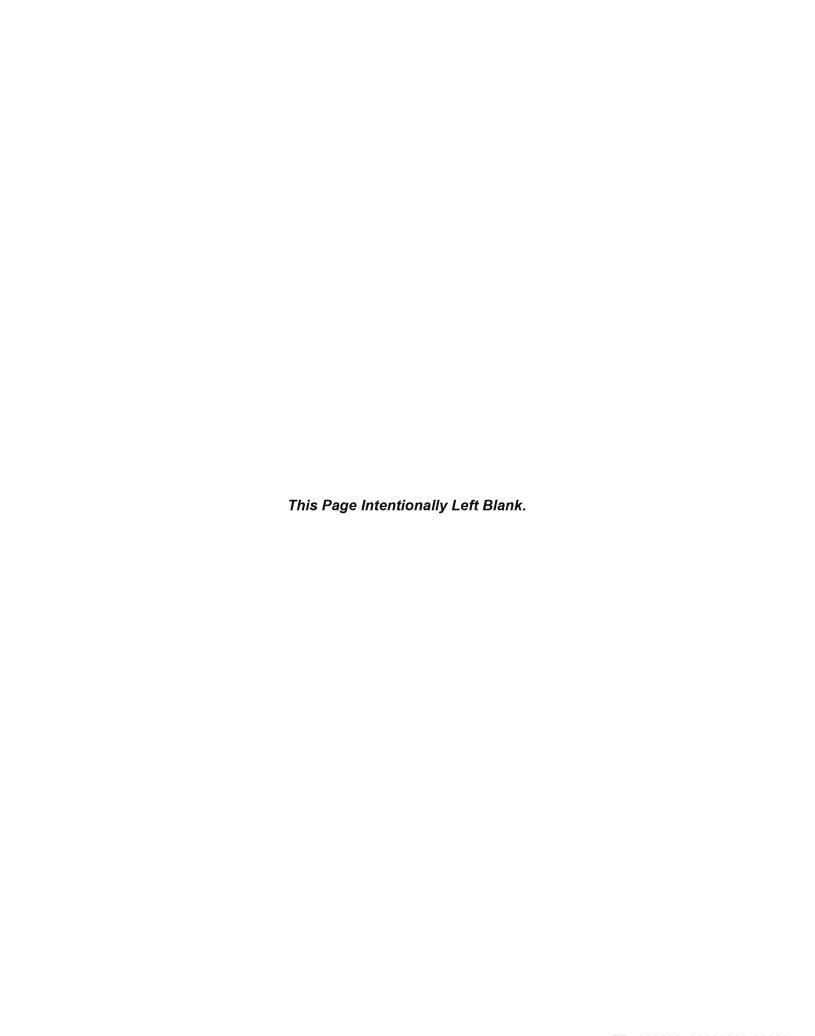


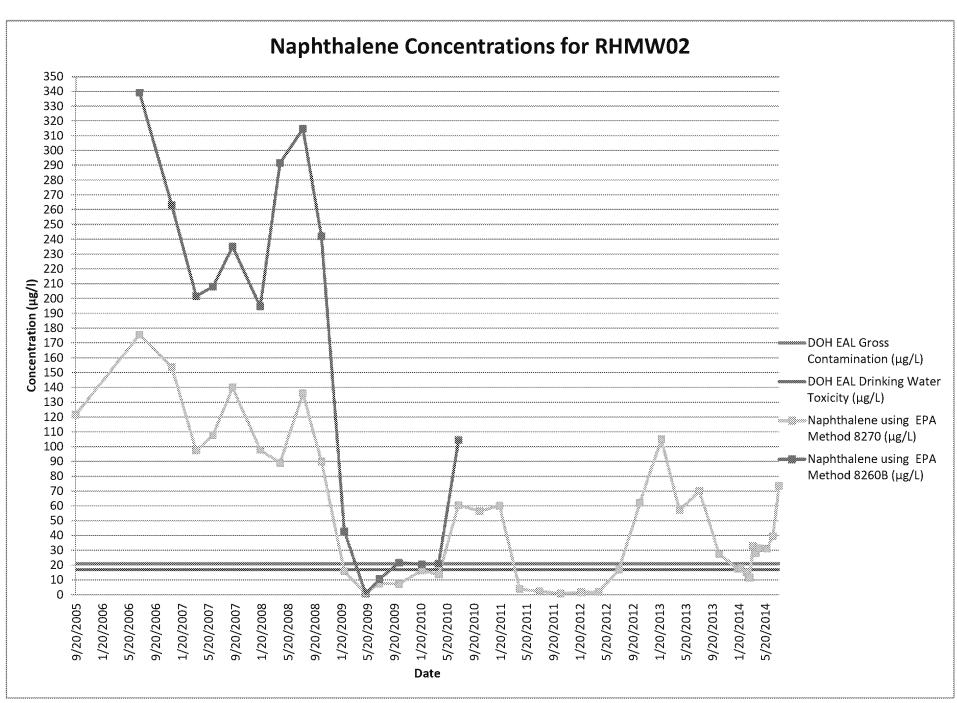
Data points for 9/20/2005 and 3/27/2007 through 4/21/2014 are the average of the primary and duplicate samples. Unfilled boxes indicate non-detections. Method detection limits are shown.



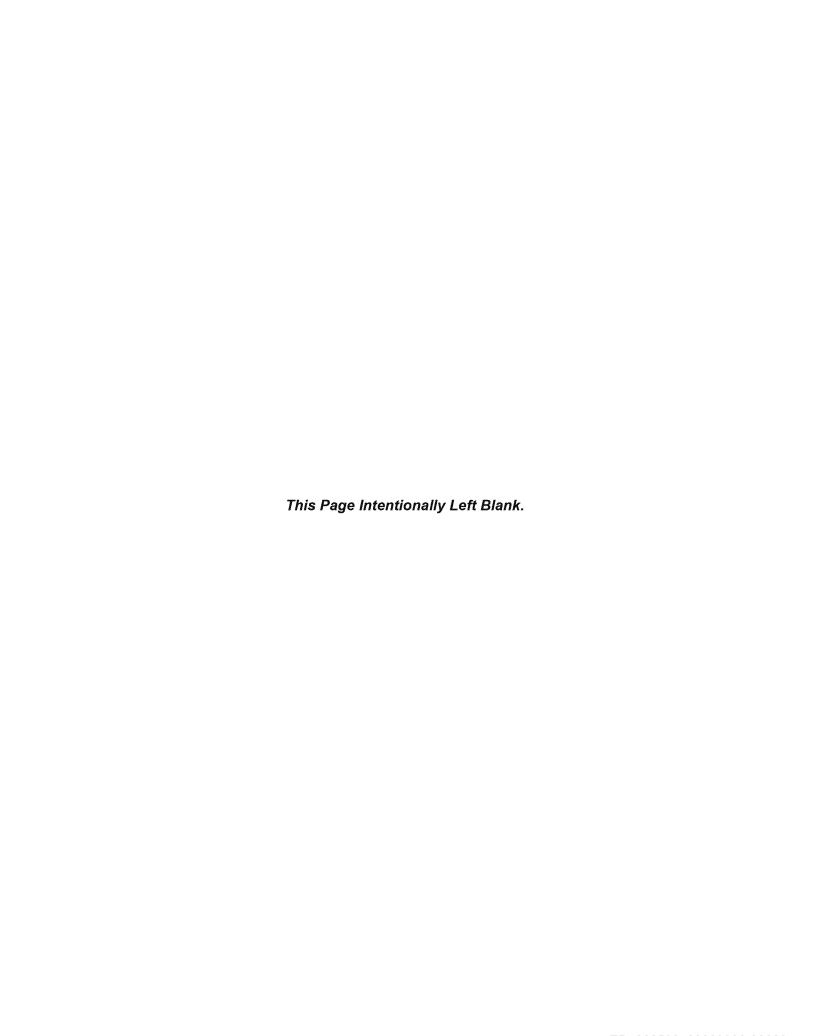


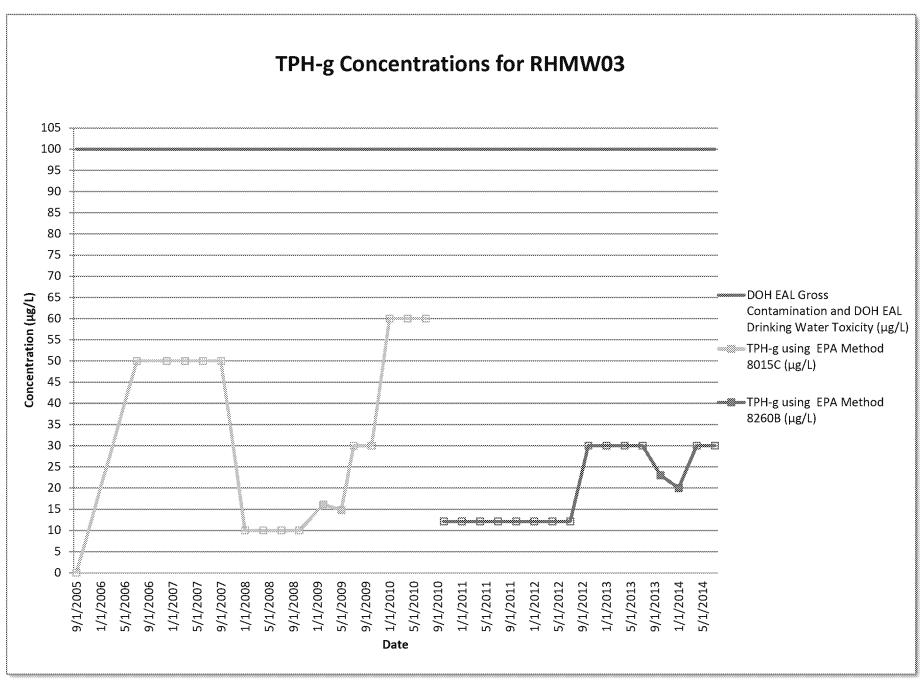
Data points for 9/20/2005 and 3/27/2007 through 4/21/2014 are the average of the primary and duplicate samples. Unfilled boxes indicate non-detections. Method detection limits are shown.





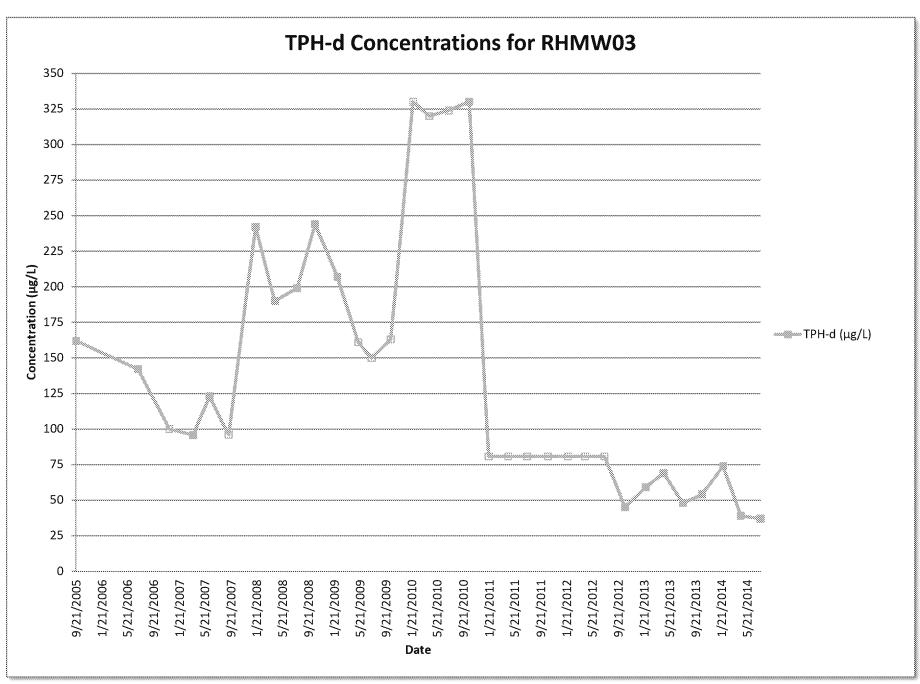
Primary sample results are shown for 1/26/2012 and 4/21/2014; all other concentrations are the average of the primary and duplicate sample results. Unfilled boxes indicate non-detections. Method detection limits are shown.





Possible laboratory contamination for 10/21/2013 and 1/28/2014 sampling events. Unfilled boxes indicate non-detections. Method detection limits are shown.

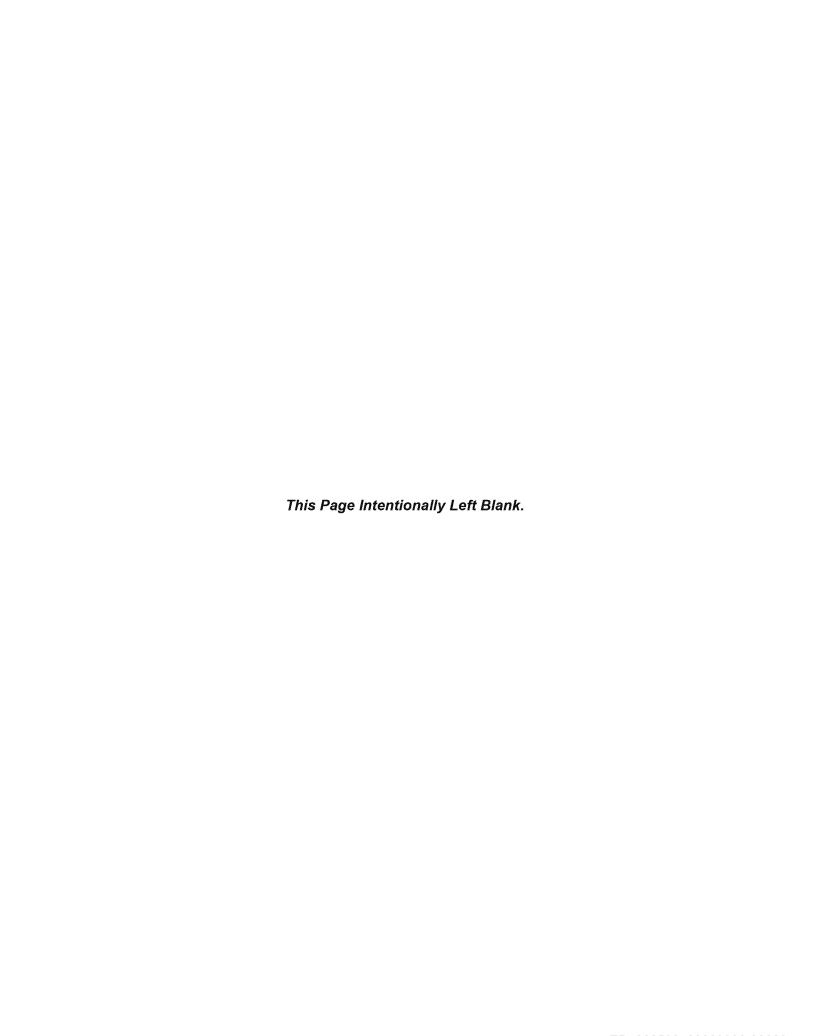


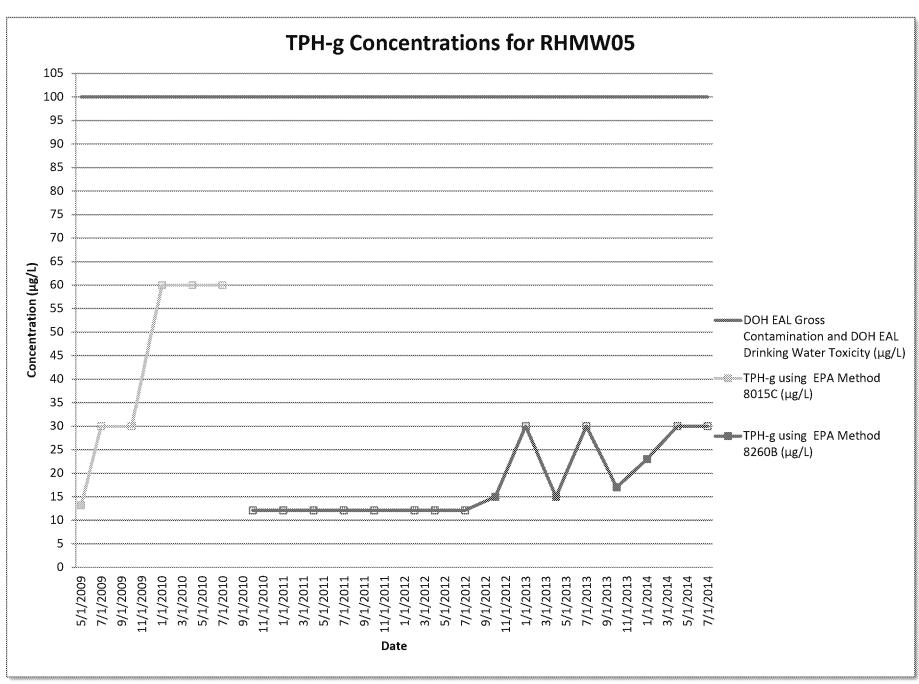


The Site-Specific Risk-Based Level (SSRBL) is $4,500 \mu g/L$.

Unfilled boxes indicate non-detections. Method detection limits are shown.

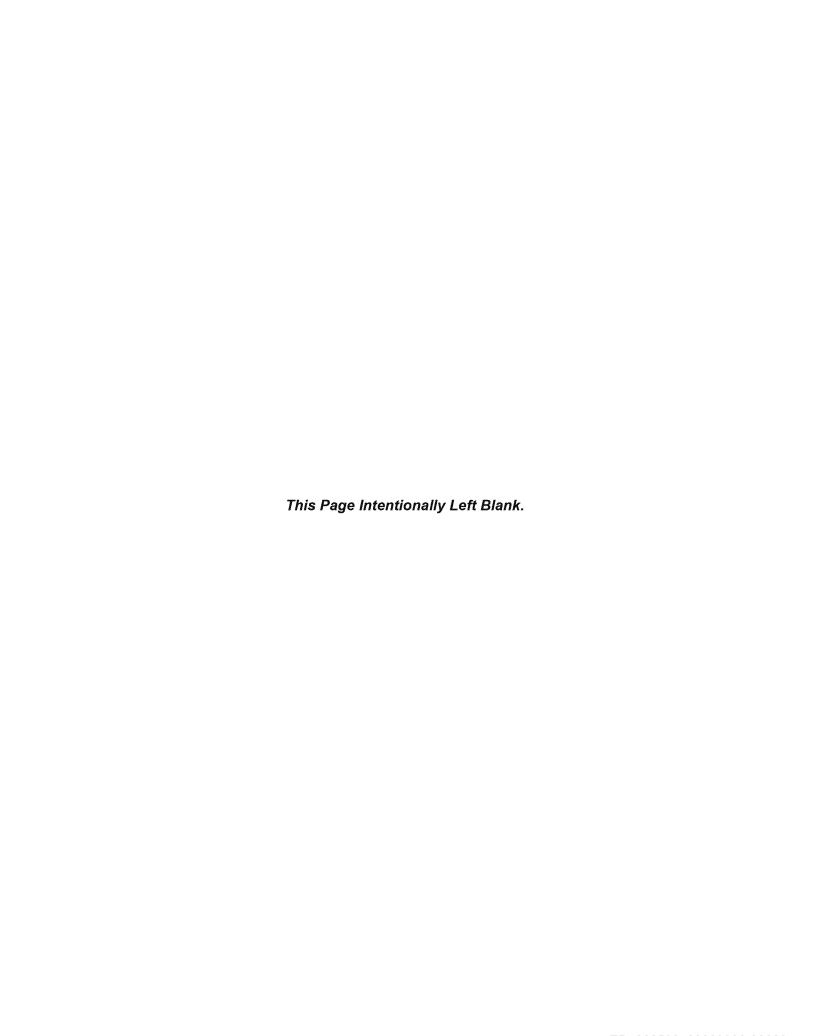
Numerous sample results had a chromatographic pattern that didn't match the calibration standard. The relatively high TPH-d values may not necessarily be indicative that there is diesel fuel or other petroleum products in the well.

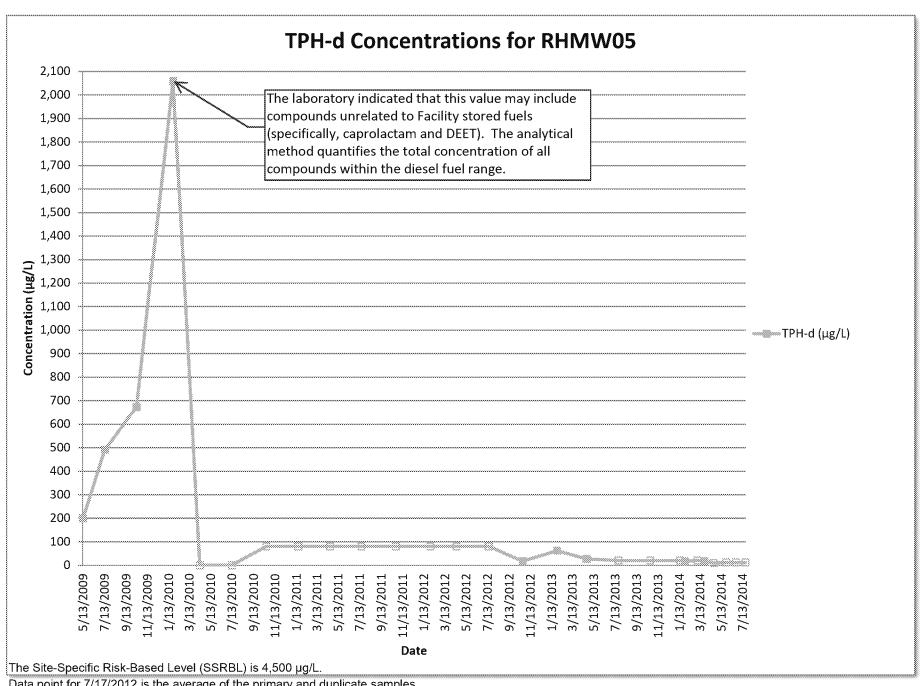




Data point for 7/17/2012 is the average of the primary and duplicate samples. Unfilled boxes indicate non-detections. Method detection limits are shown.

Possible laboratory contamination for 10/22/2012, 10/22/2013, and 1/29/2014 sampling events.

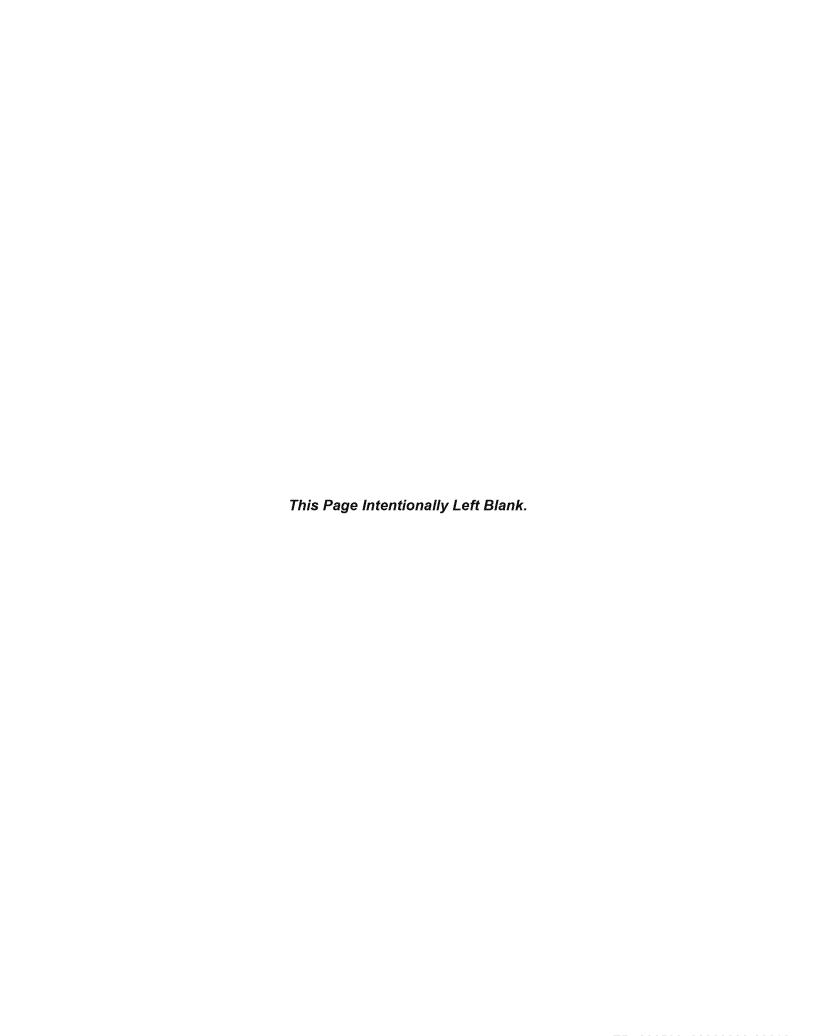


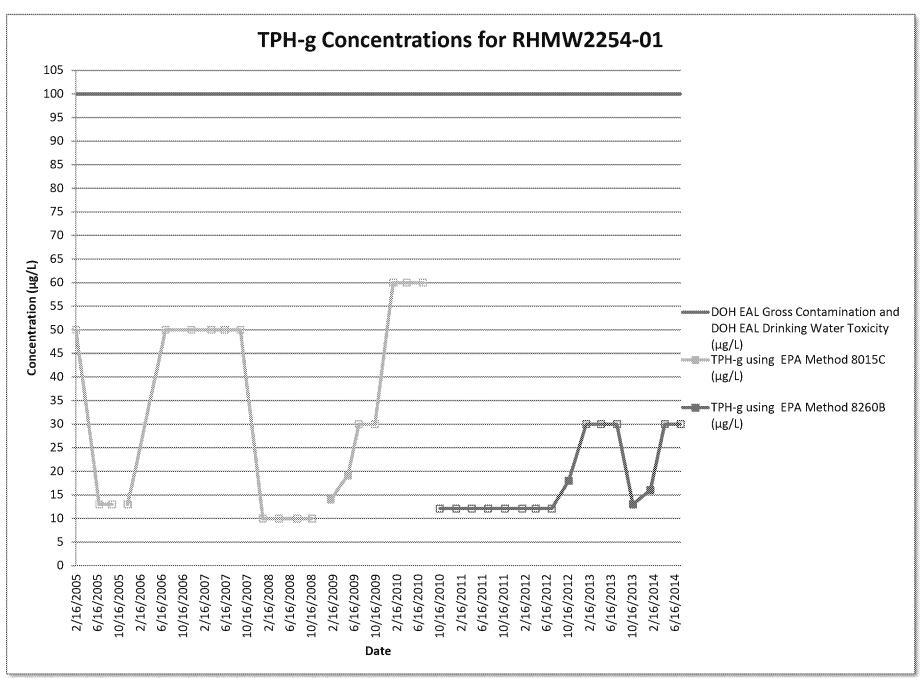


Data point for 7/17/2012 is the average of the primary and duplicate samples.

Unfilled boxes indicate non-detections. Method detection limits are shown.

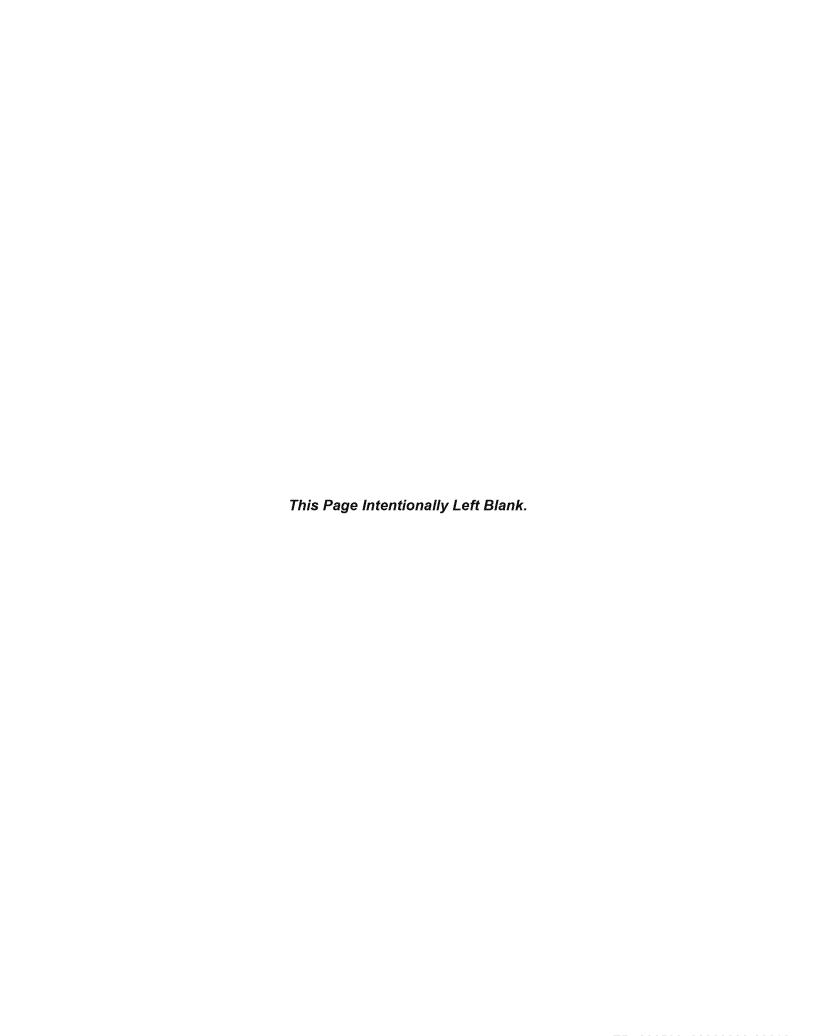
Numerous sample results had a chromatographic pattern that didn't match the calibration standard. The relatively high TPH-d values may not necessarily be indicative that there is diesel fuel or other petroleum products in the well.

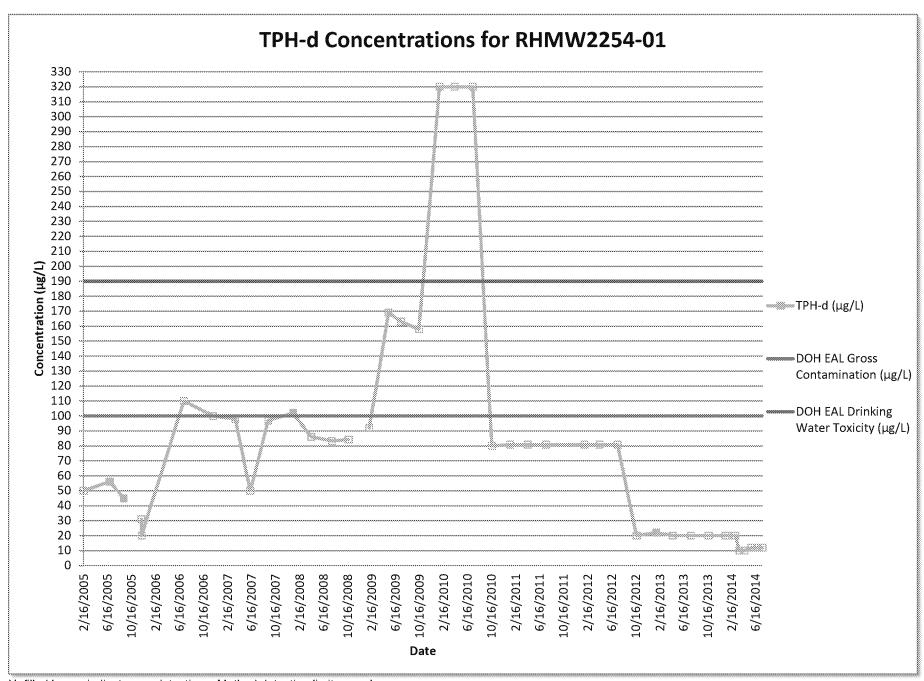




Unfilled boxes indicate non-detections. Method detection limits are shown.

Possible laboratory contamination for 10/22/2012, 10/22/2013, and 1/29/2014 sampling events.





Unfilled boxes indicate non-detections. Method detection limits are shown.

Laboratory data rejected for 1/15/2008 sampling event.

Numerous sample results had a chromatographic pattern that didn't match the calibration standard. The relatively high TPH-d values may not necessarily be indicative that there is diesel fuel or other petroleum products in the well.

